the OIL AND GAS JOURNAL

NOVEMBER 5
1942

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OIL WELL CEMENTING COMPANY

DUNCAN OKLAHOMA

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We'd always ordered alloy-steel studs for a cover plate in one of our high-pressure jobs. Never thought of using anything else. Then a Bethlehem engineer showed us how we could get quicker deliveries, just as good results, and also help save critical materials, by using heat-treated carbon steel instead.

I was in a rush for a special size and type of bolt and nut. When it didn't look like I was going to get what I wanted, I talked with a Bethlehem engineer. He showed me how a standard-sized bolt and nut would do the job just as well. I changed my order and got delivery today!

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BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY

American steel producers and steel warehouses are mobilizing their sales personnel to help you do a 100% job of getting in the scrap

WE'VE called him Bob Martin for short. He may be a U·S·S salesman, or he may represent some other steel supplier. In any case, it's his job to help you get the steel you need for war production when you need it. Things being what they are, that's a tough assignment in itself.

But now Bob Martin and many of his fellow salesmen have another war job. They've been made scrap expediters, too! The grave need for more scrap to produce more steel calls for unprecedented action. That's why the Steel Industry has joined forces with the War Production Board to make a thorough, continuous canvass of scrap resources in the plants of steel consumers.

So don't be surprised if the next steel salesman who calls at your plant asks first how he can assist your scrap drive. His experience equips him to help you do the best possible salvage job. And he has been given special information by the WPB to make his efforts tie in closely with the Government's salvage program.

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On his new job as a scrap fieldman, in cooperation with the WPB, the steel salesman assigned to your plant will:

1. Call on a principal executive. Explain the WPB Dormant Scrap Drive objectives, and ask for your active and immediate cooperation.
2. Help, in doubtful cases, to identify dormant scrap, such as obsolete machinery, tools and equipment which are useless to war production because they are broken, worn out or not repairable.
3. Assist in facilitating the disposal of dormant scrap.

The need for scrap is URGENT! By December 31, 1942, an inventory of 7,000,000 tons must be made available to steel mills. Do *your* part by helping the steel salesman to do *his* part in this all-important drive.

HELP FOR YOUR SCRAP DRIVE

Inform your employees by showing the new sound slide film, "Let's Get in the Scrap." We'll be glad to lend you a print. Write to United States Steel Corporation, Room 1637, 436 Seventh Avenue, Pittsburgh, Pennsylvania.

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AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York* · CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago* · COLUMBIA STEEL COMPANY, *San Francisco* · NATIONAL TUBE COMPANY, *Pittsburgh* · TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham* · SCULLY STEEL PRODUCTS COMPANY, *Chicago, Warehouse Distributors*

UNITED STATES STEEL

"THRU-PUT INCREASED 19%"

Perhaps there is an idea in this letter for getting more production out of *your* boilers, kilns, stills. The general manager of an oil refinery near Chicago (name furnished upon request) describes results obtained with Coppus-Dennis Fanmix Gas Burner:

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Bulletin 410-3 will tell you about the perfect gas-air ratio and complete instantaneous combustion you get with Fanmix. Also describes famous Coppus "Blue Ribbon" design features. Check the coupon for a free copy.

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Fit the steam turbine to the job and save investment and maintenance cost. There are six frame sizes of Coppus Steam Turbines — with ratings from 150 HP down to fractional — and prices to match.

If it's a small-HP job, it's a Coppus job. And "Blue Ribbon" manufacturing (precision-built dynamometer-tested) means trouble-free performance. Check coupon for Bulletin 135-9.

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COPPUS ENGINEERING CORPORATION

451 Park Avenue, Worcester, Mass.

Sales Offices in Thomas' Register. Products in Refinery Catalog Product Reference

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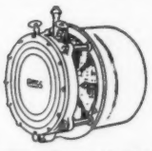
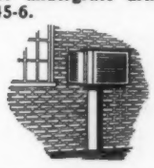
☐ Coppus Boiler Manhole Blowers and Exhausters. For cooling boilers, drums, etc. Bulletin 161-3.

☐ Coppus Heat Killers. Keep production up by keeping men cool. No stale air recirculation. Air is directed. Bulletin 160-5.



☐ Coppus Type C Turbo Blower. For undergrate draft. Bulletin 145-6.



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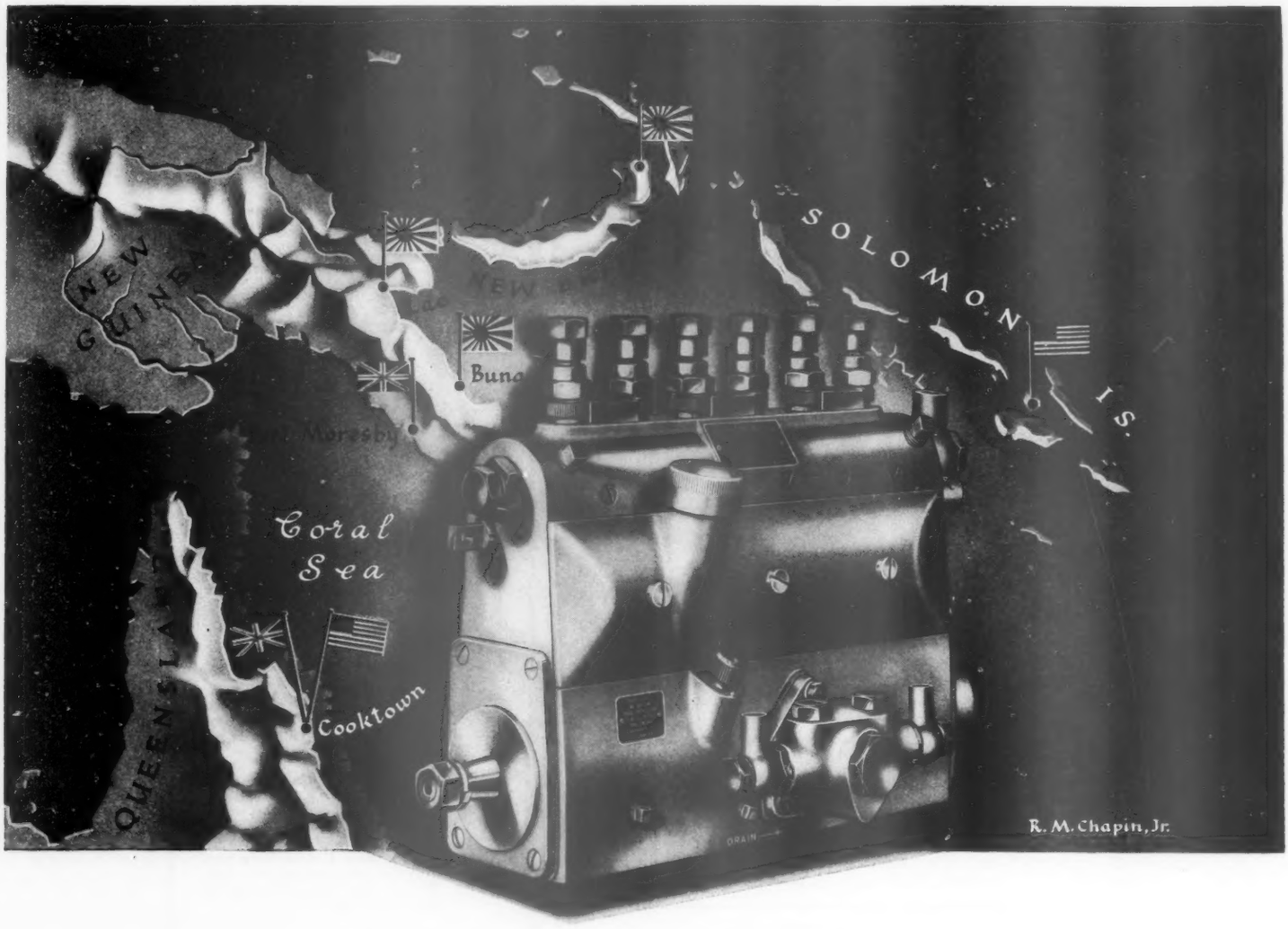


ON THE JOB

ON LAND and sea American Bosch fuel injection equipment is at work, helping deliver power and ever more power when and where most needed to expand America's war might . . . in submarines and other warships, in tanks and other Army equipment, in transportation, and for power plants from Portsmouth to Port Moresby, from Sault Ste. Marie to the Solomons.

Maximum Diesel engine performance demands the highest degree of perfection in the fuel injection system. This in turn requires expert engineering and manufacturing precision measured in millionths. "Beat The Promise" production necessitates instant availability of the widest possible range of equipment types and sizes.

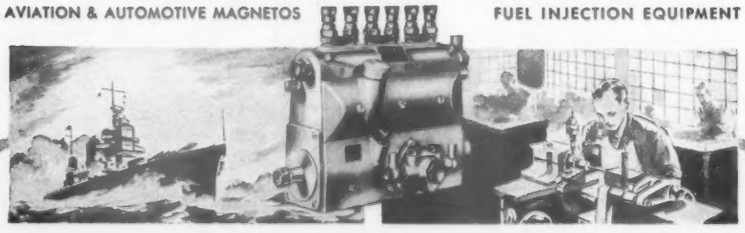
American Bosch experience, engineering service, range of equipment, and production accuracy are daily meeting these requirements. Small wonder, then, that it's American Bosch equipment that's "on the job" where things happen in the United Nations war effort.

American Bosch Corporation • Springfield, Mass.

Craftsmen in the New England Tradition

AMERICAN BOSCH

AVIATION & AUTOMOTIVE MAGNETOS — FUEL INJECTION EQUIPMENT



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General Heading: **BAKER MODEL "K" CEMENT RETAINER**

Unit No. **A-19**

Subject: **Squeeze Cementing Shut Off Wet Zone**

BAKER OIL TOOLS, INC.

Main Office and Factory:
6000 So. Boyle Ave., Box 127, Vernon Station, Los Angeles, Calif.

Central Division Office and Factory:
6023 Navigation Blvd., Box 3048, Houston, Texas

Export Sales Office:
19 Rector Street, New York, N. Y.

Index: 250.1

Date: November 5, 1942

Page: 1 of 1 p.

Squeeze cementing affords a safe, economical solution to many present-day well repair and well completion problems.

Thousands of such jobs have been successfully performed with the Baker Model "K" Cement Retainer, which has long been a standard unit of equipment for accomplishing difficult as well as the usual run of squeeze cementing jobs.

Two such typical applications are described and illustrated below.

Today, with conservation of time and materials being of the utmost importance, it is essential that successful results be secured the first time . . . and the Baker Model "K" Cement Retainer has a reputation for obtaining a successful "first-time" job.

If you are not familiar with this device, you can secure complete details from any Baker office or field representative, or see pages 250-263 of the 1942 Baker or Composite Catalog.

Service Note

Competent Baker men will service, make suggestions, and otherwise assist in securing best possible results.

Prod. No. 400
Baker Model "K" Cement Retainer

BAKER MODEL "K" CEMENT RETAINER APPLICATIONS

Recementing • Cementing Behind Sections of Pipe
Reducing Gas/Oil Ratios • Plugging Off Bottom Fluids
Plugging Back to Upper Zones
Testing Upper Cased Formations • Squeeze Jobs
Cementing Off to Perforate for Production
Cementing Bad Pipe • Cementing Two Strings Together
Cementing Low-Pressure Zones
Use of Cementing Retainer as Casing Bridge Plug

JOB NO. 1

PROBLEM:

To shut off water entering from bottom of producing zone.

METHOD:

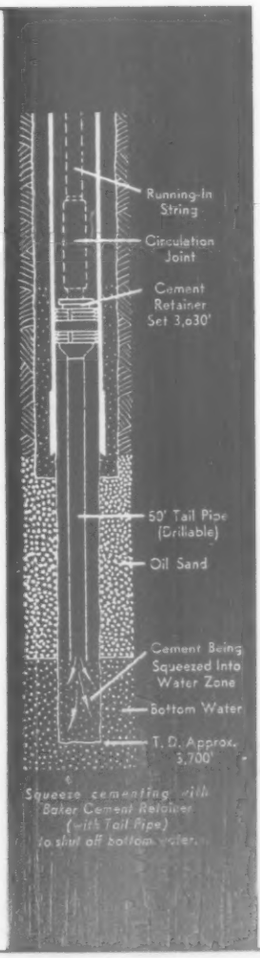
Squeeze cement with Baker Cement Retainer equipped with 50' (drillable) Tail Pipe.

RESULT:

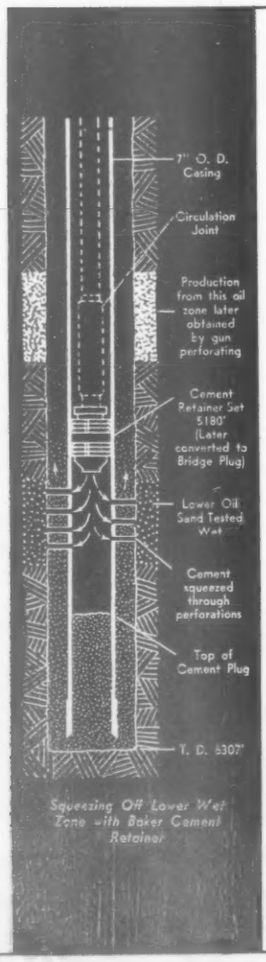
Water completely shut off (before performing squeeze, production was cutting 35% water).

DETAILS:

Field: Kilgore, Texas
Depth of Well: 3700'
Depth Retainer Set: 3630'
Breakdown Pressure: 500 pounds
Final Pressure: 2100 pounds
Number of Sax Put Away: 534
How Cement Discharged: Through lower end of Tail Pipe into open hole.



Squeeze cementing with Baker Cement Retainer (with Tail Pipe) to shut off bottom water.


7" O. D. Casing
Circulation Joint
Production from this oil zone later obtained by gun perforating
Cement Retainer Set 5180' (Later converted to Bridge Plug)
Lower Oil Sand Tested Wet
Cement squeezed through perforations
Top of Cement Plug
T. D. 6307'

Squeezing Off Lower Wet Zone with Baker Cement Retainer

JOB NO. 2

PROBLEM:

To squeeze off lower wet sand and protect upper oil zone.

METHOD:

Perform squeeze cement job with Baker Cement Retainer and then convert Retainer to Casing Bridge Plug.

RESULT:

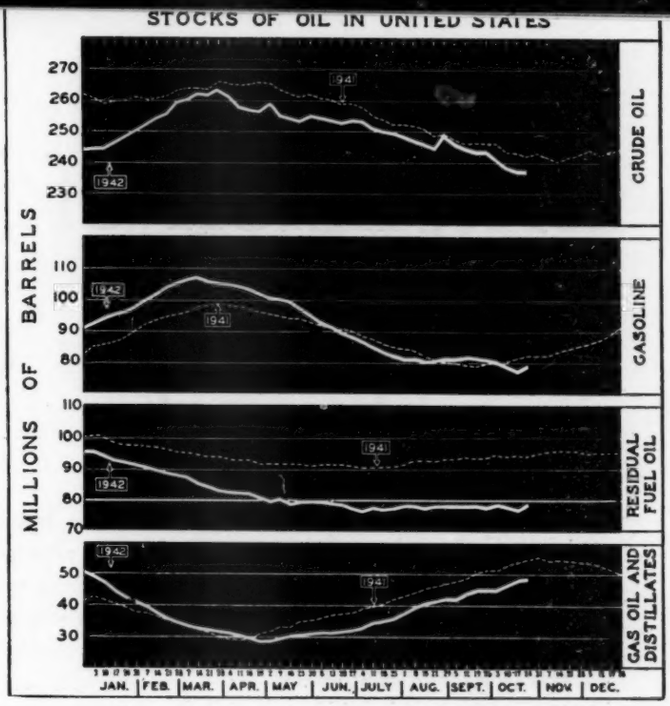
Wet zone completely shut off; upper zone produced with no water.

DETAILS:

Field: Golden Meadows, La.
Depth of Well: 6307'
Depth Retainer Set: 5180'
Breakdown pressure: 1400 pounds
Final Pressure: 2500 pounds
Quantity of Cement Mixed: 300 Sax
Number of Sax Put Away: 300
How Cement Discharged: Through Perforations

Trends

Changed Marketing Requirements Bring New Crude Demands



THE possibility that a group of Oklahoma and Kansas refiners will endeavor to secure a larger percentage of the production in the two states is indicative of the changed conditions in refinery operations brought about by war developments. Previous to the start of the war the trend in refinery operations in the Oklahoma-Kansas area over a period of years had been downward. This was particularly true in Oklahoma where two decades ago the state refined 15 per cent of all the crude oil refined in the United States. This has decreased to approximately 5 per cent. This development in Oklahoma was due to several causes, the most important of which were the decrease in crude-oil production and the expansion of crude-oil and product pipe-line-transportation systems to northern markets.

The heavy tank-car movement to the East starting early in the year has changed this situation. The 45 refineries in Oklahoma and Kansas and 2 in the adjoining state of Missouri have more demand than supply. Their local demands have increased; their shipments to the Middle West have expanded and in addition they are making substantial train-load shipments to the Atlantic seaboard states. Despite these requirements crude runs to stills which now average around 355,000 bbl. daily are practically the same as they were 6 months ago and less than 40,000 bbl. daily over a year ago. Stocks of products are substantially lower than they were a year ago.

Surveys have shown that refiners in the three states could process at least 50,000 bbl. daily at their plants if they could get the crude oil. In many instances the crude-oil production in the area near the refinery has decreased and no outside supplies are available except as they can be delivered by the major pipe-line systems. The fear expressed by the refiners is that in helping to make up the deficits in the Eastern states and other areas, they will jeopardize their business closer at home to which they must look under normal conditions. Their contention is that they should be supplied the crude oil to take care of any business outside their normal marketing areas.

The solution to this problem is difficult, according to state conservation officials, representatives of OPC and others who have made a study of conditions. Enlarged local deliveries by the major buyers and transporters of crude oil mean that much less crude for the refineries to the North, some of which are also short of crude oil. The remedy that has been suggested by some familiar with conditions is the looping and extension of existing lines to connect to new supplies in West Texas and other Texas areas.

CRUDE PRODUCTION *3,926,510 bbl. daily average—up 1,490 bbl. One year ago 4,074,300 bbl.*

CRUDE STOCKS *237,986,000 bbl. as of Oct. 24—down 132,000 bbl. One year ago 242,261,000 bbl.*

GASOLINE STOCKS *79,545,000 bbl. as of Oct. 24—up 589,000 bbl. One year ago 82,390,000 bbl.*

RESIDUAL FUEL-OIL STOCKS *79,073,000 bbl. as of Oct. 24—up 536,000 bbl. One year ago 94,339,000 bbl.*

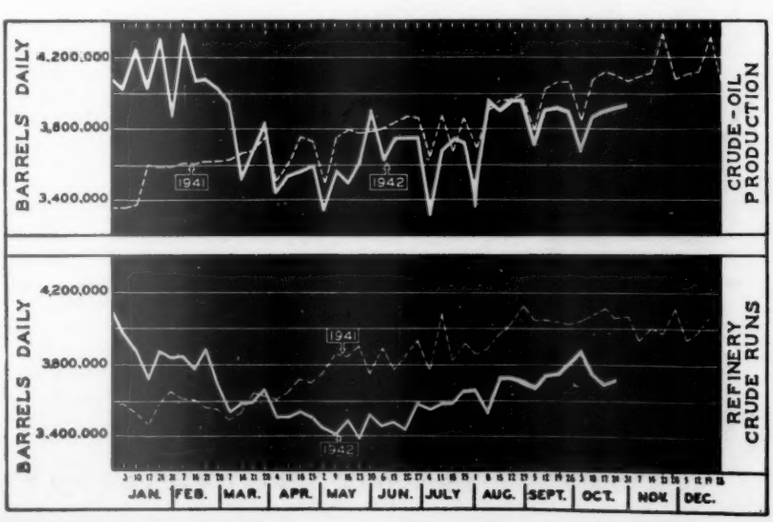
GAS OIL AND DISTILLATES *47,567,000 bbl. as of Oct. 24—up 641,000 bbl. One year ago 54,946,000 bbl.*

REFINERY RUNS *3,776,000 bbl. daily week ended Oct. 24—up 67,000 bbl. One year ago 4,071,000 bbl.*

Refinery figures delayed by Election Day.

DAILY AVERAGE PRODUCTION FOR WEEK

	Oct. 31 crude oil	Oct. OPC quota all oils	Oct. 24 crude oil
Arkansas	73,300	79,500	73,880
California	712,750	782,000	735,275
Colorado	6,520	7,000	6,640
Eastern fields	96,750	107,400	97,000
Illinois	264,600	280,000	264,815
Indiana	17,250	19,000	16,750
Kansas	297,700	294,000	303,900
Louisiana	329,200	337,200	327,900
North Louisiana	*98,200*	.....	*97,900*
Louisiana Gulf Coast	*231,000*	.....	*230,000*
Michigan	60,200	65,700	62,300
Mississippi	69,200	50,000	69,700
Montana	22,560	24,400	22,785
Nebraska	3,400	3,500	3,475
New Mexico	101,550	101,100	102,340
Oklahoma	368,050	417,000	364,450
Texas	1,410,400	1,407,600	1,379,800
East Texas	*362,000*	.....	*362,000*
West Texas	*231,000*	.....	*210,000*
North Central Texas	*140,000*	.....	*140,000*
East Central Texas	*90,200*	.....	*97,000*
Texas Panhandle	*98,500*	.....	*85,400*
Texas Gulf Coast	*420,000*	.....	*418,000*
Southwest Texas	*68,700*	.....	*67,400*
Wyoming	93,080	90,800	94,010
Total United States	3,926,510	4,066,200	3,925,020
Total production, January 1-October 31, 1942			1,155,712,735 bbl.
Same period last year			1,147,950,425 bbl.



Extension of WEP Line to Bring Major Changes

By PAUL REED

The petroleum transportation situation affecting the East Coast is indicated by two charts drawn to scale to show status of pipe lines, tank cars and ocean tankers in the war period. The recently authorized extension of War Emergency Pipelines, Inc.'s 300,000-bbl. 24-in. line promises to have profound effects resulting from its unique relationship to other facilities when it is completed to New York-Philadelphia areas in June, 1943.

WHEN Coordinator Harold L. Ickes announced the 24-in. War Emergency pipe line from Texas would not only be extended to the East Coast but that it should be paralleled by a large-diameter products line, he emphasized that the project is a vital part of the national program for taking the war to the enemy more effectively. This is because the construction of the big-inch line will make possible the removal of tankers for service at the theaters of war.

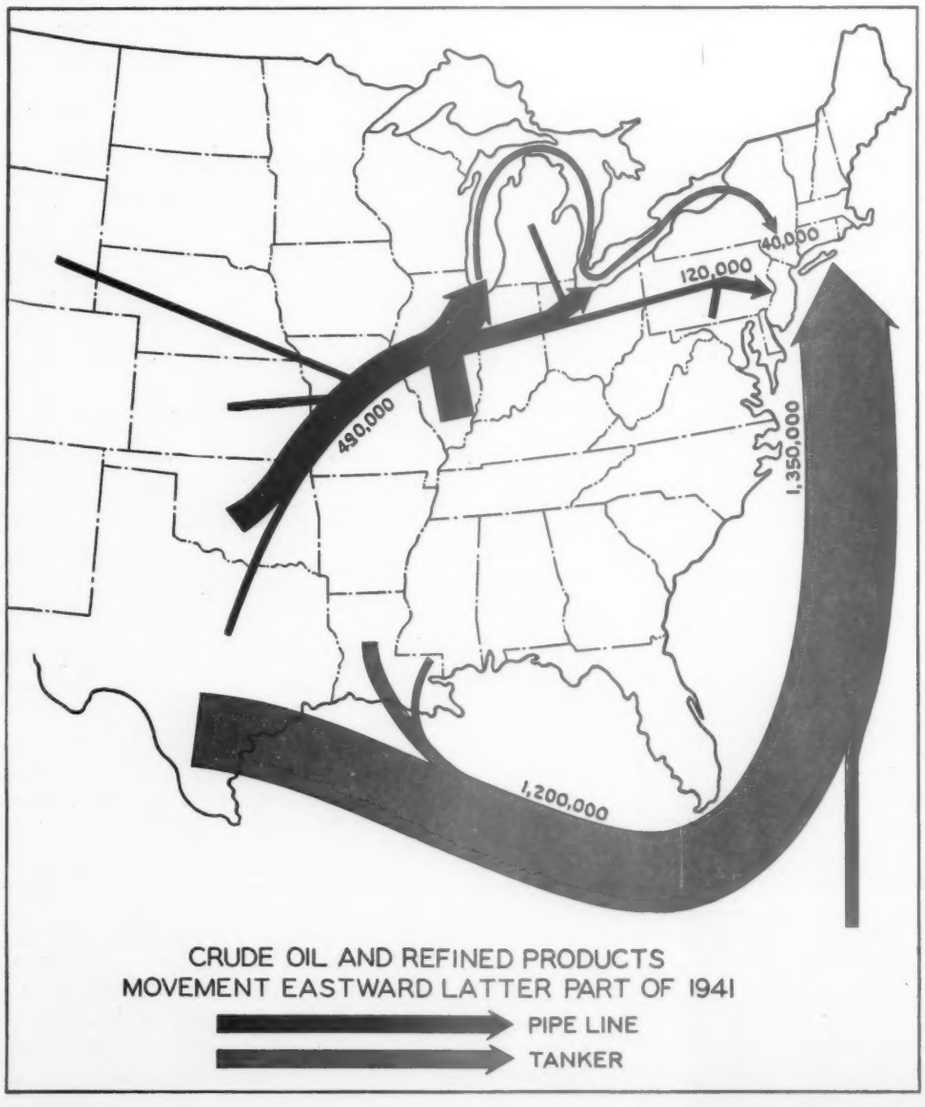
The project represents a step which is as revolutionary in petroleum transportation as butadiene manufacture is in refining.

Why wasn't the War Emergency pipe-line project built as a single undertaking instead of in two sections, one from East Texas to Norris City, Ill., and the other from Norris City eastward? This question is frequently asked. The explanation is that Army-Navy Munitions Board found it could spare 137,500 tons of steel for the building of a pipe line between July and November. A 24-in. pipe line made from this amount of steel would extend northeastward from Longview, Tex., only as far as Norris City, Ill. Although this tonnage was sufficient only for building a line part way to the East Coast, proponents of the project decided to accept the offer in the hope that additional steel would be available later in the year for completing the whole undertaking.

For the 857-mile extension from Norris City, Ill., eastward, 224,000 tons of steel will be required. Total steel tonnage of 24-in. pipe will be 361,000 tons for the entire project. The 857-mile segment will cost $60,000,000. For the whole project the Government has tentatively allotted $95,000,000.

The entire undertaking is being financed by the Government and the line will be owned 100 per cent by Defense Plant Corp., a subsidiary of RFC. Construction of the line is being handled by War Emergency Pipelines, Inc.

With the construction of pipe-line facilities between Texas and the East Coast, the U. S. Government is acquiring a system which will hold a strategic position in petroleum transportation of the country in war and peace.



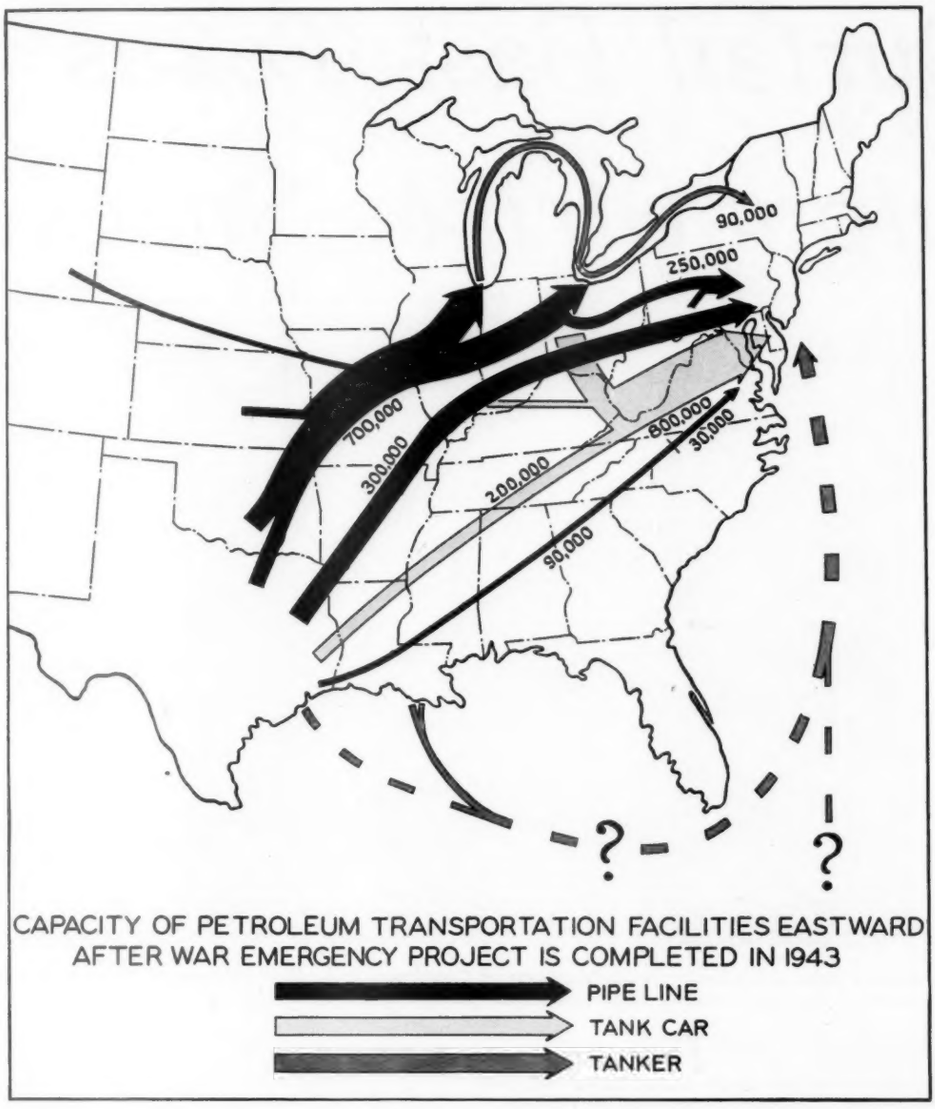
Line Relieves Tankers

As the result of design and supervision by major-company executives, the federal Government is obtaining a pipe-line system which can be operated at high capacity and at lower cost per barrel-mile than any system operated by major companies. Since the big-inch line furnishes an economical outlet for areas which have been served primarily by tankers, it appears that future tanker transportation programs will be planned with recognition of the secondary and supplementary function which they are to perform.

The profound changes brought by the new conditions are indicated in the accompanying charts. The quantities of crude and refined petroleum moving from the Southwest to the East Coast by pipe line and tanker in 1941 are shown on one chart. The other chart shows the capacity of petroleum-transportation facilities which will be available for this movement when the 24-in. crude line will begin to operate in June 1943. This latter chart shows tank-car capacity as 800,000 bbl. daily since the railroads have demonstrated that they could handle this amount in recent months when this remarkable movement has risen to a peak from a negligible amount before the submarine campaign.

Traffic conditions may require a lessening of tank-car shipments when the line to the East Coast starts to function. For this reason, on such a chart it appears preferable to indicate capacity of future facilities rather than to attempt a prediction as to the extent they will be used.

As soon as oil reaches Norris City loading racks, shipments by tank car may increase from 120,000 to 150,000 bbl. per day to East Coast points. But tank cars are going out of service at an alarming rate because of the high speeds at



which they have been operated in recent months. Therefore, increase in shipments may be nearer 120,000 than 150,000 bbl. daily.

In its simplest terms the program under consideration for feeding the big line with a daily capacity of 300,000 bbl. consists of diverting the following crude movements: (1) Flow of East Texas crude to East Coast now being handled by railroads. (2) A large part of the flow of crude from East Texas to Gulf Coast refineries. (3) Movements of crude and heating oil previously scheduled for shipment from the Gulf Coast by ocean tankers to the East Coast.

When the Texas-East Coast line is completed in June 1943, as many as 72 tankers will be released, according to Mr. Ickes, which will be available for military and naval service. In the type of war now being waged in remote parts of the world, there is great need for a large number of tankcrs because tankers must serve as floating storage for considerable periods before they are unloaded.

Although Mr. Ickes has expressed hope that the Texas-East Coast pipe-line program would alleviate the eastern shortage of petroleum for civilian use, he emphasized that much would depend on the extent of military demands which must be met first. "Only by having such a pipe line," Mr. Ickes has said, "can the Atlantic seaboard be provided with a dependable additional supply of oil so essential to the successful prosecution of the war."

According to B. E. Hull, vice president and general manager of War Emergency Pipelines, Inc., much credit should be given to the contractors for fine accomplishment in the rapid building of the first section of the line. These include Williams Brothers Corp., Anderson Brothers, Oklahoma Contracting Co., O. E. Dempsey Construction Co., C. S. Foreman Co., Ray L. Smith Construction Co., and Sheehan Pipe Line Construction Co. All of these are general contractors engaged on the line. Stringing contractors are J. Hobson Dunn, Parkhill Truck Co., and J. L. Cox. H. C. Price Co. subcontracted welding of one section and fabrication for pump stations. George C. Bolz Dredging Co. dredged the Mississippi River crossing. C. S. Seal cleared 215 miles of right-of-way through the thickly timbered section of Arkansas.

The heads of these contracting firms have given close personal attention and have exerted much more effort to do a good job for the industry and Government than was required in the terms of their contracts, according to Mr. Hull.

Each of the seven contractors now engaged on the Texas-Illinois leg will be moved to the northern extension as soon as his present job is completed.

It is expected that four or five contractors will be added to the project who are not working on it now.

Altogether there will be 17 separate main-line spreads along the route between Norris City and the New York-Philadelphia refining areas working on sections varying from 40 to 63 miles, according to the terrain. For the 12 river crossings on the northern extension, two or more contracts will be let. All river crossings have been finished on the Texas-Illinois leg except at the Mississippi River where good progress is being made.

It is expected that each of the spreads will lay between 2,000 and 4,000 ft. per working day. Between January 1 and June 1 there may be only 100 working days since 1 day out of 3 may be lost by bad weather. Work will probably start in three or four places simultaneously, possibly in Pennsylvania and Ohio.

The Norris City-East Coast extension will follow a general route indicated as follows:

From Norris City, south of Princeton, Ind., north of Paoli and Seymour, and midway between Columbus and Vernon, Ind. From there it will pass into Ohio, going north of Hamilton and Cincinnati, south of Columbus. It will pass south of Wheeling, W. Va., and then into Pennsylvania, running north of Waynesburg and Uniontown, and ending near Phoenixville.

Between Phoenixville, Pa., and the Bayonne-Bayway, N. J., area and the Philadelphia area there will be two branches totaling between 125 and 130 miles of 20-in. pipe. Plans have been suspended for laying a line from Norris City to a barge terminal at Mount Vernon, Ind., since effort must be concentrated on construction of the main line. However, the Mount Vernon spur may be considered later.

Feeder Lines

Feeder lines consisting of a total of about 50 miles of pipe in sizes between 8-in. and 24-in. will be started, probably about November 10 when Williams Brothers Corp. completes the section of the 24-in. line terminating at Longview, Tex. This contractor will build the feeder lines.

There will be two feeder systems. One of these will bring No. 2 heating oil from East Texas terminals of Shell Pipe Line Corp., Sun-Yount-Lee Pipe Line, and Pan American Pipe Line Co., whose lines will be reversed in order to move a total of 100,000 to 120,000 bbl. of this oil from Gulf Coast refineries. The remainder of shipments of oil for the line, amounting to about 180,000 bbl., will be crude pumped through a separate feeder system to the W.E.P. tanks at Longview, Tex. Some consideration is being given to reversing the Atlantic Pipe Line Co. trunk line to move crude from the Gulf Coast to feed the W.E.P. 24-in. line.

On October 28 contract was let to National Tube Co. for 360 miles of 24-in. for the extension. Shipments on this order will start November 12, about half of the 725 miles of 24-in. required for the project; the remainder of the pipe will be contracted later.

At the first of this week 520 miles of pipe had been shipped for the Texas-Illinois leg and 375 miles had been completed. All rights-of-way and pump-station sites have been procured and all contracts have been let for machinery and construction required for pump stations. Some of the machinery has begun to arrive. Survey parties working on the extension started last week.

Meanwhile, Coordinator Ickes reports that 65 per cent of the first leg of the big line is in the trench, and that "we are hopeful that initial delivery of oil can be moved ahead several precious days." Construction is now 2 weeks ahead of the original schedule, and "we have renewed assurance that the line will be making initial deliveries of crude oil sometime in January." First deliveries will be only about half the rated capacity of 300,000 bbl. a day, but they will step up as additional pumping stations are completed and hooked into the line.

Plan to Curtail East Texas Water Output Strikes Snags

By W. V. HOWARD

AUSTIN, Tex.—Lack of a satisfactory method of determining decline in oil production in wells making water in East Texas, last week caused Railroad Commissioners Olin Culberson and Beauford H. Jester to recess a hearing on the proposal of Joe Zeppa, independent operator of Tyler, Tex., to shut in wells making an excess of water and permit the operators to substitute production from other leases. At the direction of Mr. Culberson, commission engineers were to meet with representatives of operators in Kilgore on November 4 and the salt-water hearing will reconvene immediately after the state-wide proration meeting on November 19.

In opening the October 29 hearing, Mr. Culberson pointed out that facilities under construction for water disposal were insufficient to handle the increasing output of water in the west side of the East Texas field and the pressure decline in the area. He then reviewed the proposal of Mr. Zeppa which was calculated to relieve the situation. Briefly this plan provides that:

1. Previous orders shall remain in effect except where they are amended by the present plan.

2. Marginal wells making 100 bbl. or more of water during a working day shall be shut in and shall be declined at the rate of blank barrels monthly. They may be retested at the end of 6 months and the operator has the option of accepting this decline for a total of 18 months.

3. If on test, a well produces more than 200 bbl. of water and cannot produce 350 bbl. because of pump capacity, the oil may be determined by multiplying the present oil-water ratio by 350, the total oil not to exceed 20 bbl.

4. If operator elects the decline-allowable provision, he may transfer his production to other leases in the field subject to:

(*a*) the allowable shall not be transferred for more than 18 months

(*b*) the maximum allowable transferred to any well will be 6 bbl.

(*c*) the transferred allowable shall not be produced by any well making more than 25 per cent water

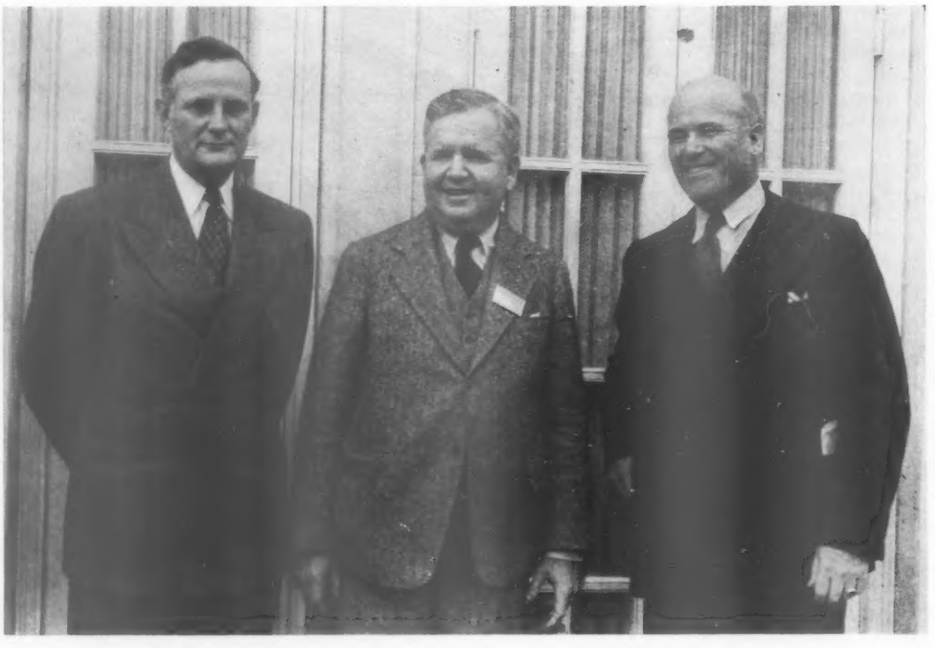
(*d*) provides for commission action and time of transfer of allowables.

In explaining his proposal, Mr. Zeppa pointed out that in Section 2, he had used the word "blank" because he had expected the rate of decline to be fixed by the commission. The 6-bbl. limit in paragraph 4b could be changed but that was the limit in the previous injection order. He had used an 18-month limit because most high-water wells would be finished in that time, but the 18-month period could be changed to read "when the decline curve for that well reaches zero."

Commissioner Culberson then presented a report on wells making more than 100 bbl. of water daily as prepared by the Railroad Commission engineering department at Kilgore. Table 1 shows the status of the wells in different brackets, based on water production.

The 1,241 wells making more than 100 bbl. of water have a total daily allowable of 3.9 per cent of the field allocation but make up 4.8 per cent of the production. They produce 79.7 per cent of all of the water withdrawn from the Woodbine sand in the field. The wells making 400 bbl. of water or more daily, comprise 0.84 per cent of the total number of wells, have 0.624 per cent of the total allowable, and produce 26.7 per cent of the water.

Fred Weeks, an attorney, who said that he represented operators whose properties make over 200,000 bbl. of this water production pointed out the advantages of leaving this water in the sand rather than pump it out and put it back again. He also suggested that the shut-in wells be not reopened. He said that it was agreed that these wells would soon be off production and that op-



Beauford Jester, junior member of the Texas Railroad Commission; E. L. DeGolyer, assistant deputy petroleum coordinator and Olin Culberson, Texas commissioner, pictured at last week's hearing in Austin

TABLE 1—A RECAP BY BRACKETS OF THE EAST TEXAS FIELD SALT-WATER AND WELL-STATUS REPORT AS OF JUNE 15, 1942

Bracket of salt water in barrels—	Number of wells	Bbl. of salt water per day	Bbl. of oil per day
100 to 150	265	38,572	5,362.18
150 to 200	203	35,396	3,223.71
200 to 250	201	44,263	3,111.01
250 to 300	138	37,557	1,968.34
300 to 350	120	38,666	1,732.07
350 to 400	98	36,574	1,383.11
400 and up	216	116,197	3,159.88
Total	1,241	347,225	19,940.30

NEXT WEEK—A. P. I. NUMBER

This number, an annual feature of The Oil and Gas Journal, will present an account of the Chicago meeting of the American Petroleum Institute and the November sessions of the Petroleum Industry War Council which will also meet in Chicago.

Leaders of industry feel that these two meetings will constitute one of the more important assemblies in petroleum history. Several Journal editors will telegraph news developments of the sessions up to press time.

Over 50 pages of the Journal will be devoted to the technical papers and engineering discussions to be presented at the A. P. I. sessions.

Another feature will be reports on the addresses of key officials of the Office of Petroleum Coordinator and other Washington agencies.

erators entering the plan would expect it. However, he proposed that the time limit be extended to 30 months. More wells would be brought in that way, he claimed, and the water problem for those wells would be permanently solved. Mr. Weeks also proposed omission of the word "marginal" as many of the worst water wells are not marginal producers.

He agreed with Mr. Zeppa, in suggesting an optional retest at the end of 6 months but added that if the operator at that time elected the decline rate, his well could be plugged and the equipment salvaged.

Plugging of the last well on the lease while production was being obtained by other leases need not mean abandonment of the lease, as this would permit a new lessee to attempt to start operations. Finally, he pointed out that production from half of the wells making large amounts of water could not be transferred to leases operated by the same producer. He suggested that in such cases the operator be permitted to transfer production to leases operated by others.

Gulf Opposition Voiced

Joe Russell, representing Gulf Oil Corp., said that his company was opposed to the commission ordering any transfer from one lease to another on the grounds that equity and property rights would not be maintained. To this, Mr. Weeks replied that they were not now being maintained in the case of operators who had leases producing little water near salt-water-injection wells.

G. C. Condra, representing Stanolind Oil & Gas Co., suggested a decline rate of 1 bbl. a month and said that his company would do everything possible to help the plan within reasonable limitations. John Suman, vice president, Humble Oil & Refining Co., said that his company estimated 75 per cent of the high water wells were owned by operators with transferable leases. As to the others, he said, his company will take its share of transfers if a reasonable decline is adopted. M. Albertson, Shell Oil Co., Inc., said that his company would also go along on this basis.

Mr. Zeppa then suggested dropping the time limit and using the decline-curve method for all wells. To eliminate the word "marginal" would add to confusion because we know what a marginal well will make but we do not know what the others will produce. All we know is that they will make 20 bbl. plus. The "plus" may be 1 bbl. or 30 bbl. and we can't use the curve if we do not know where to start it. He also pointed out that if, after the 6-month test, a well's potential had not declined, that would indicate that it was draining an isolated pocket and should be put back on production. As for the bonus, he did not think that people should get a bonus for doing the right thing. However, operators transferring their production were actually getting a bonus because the economic limits of production were not zero, whereas the transferred production was being calculated to zero. Also operating costs would be much less and he had the use of equipment that he otherwise could not have.

Mr. Culberson then referred the problem of the decline curve to the meeting of engineers at Kilgore on November 4 and was about to adjourn the meeting when Paul MacDermott, representing Sinclair Prairie Oil & Gas Co., pointed out that increased production in the fairway would result in further drainage of wells just west of the water-oil contact so that the transferred allowables would hasten water encroachment into the fairway. He also pointed out that the operator offsetting leases to which allowables were transferred might demand greater allowables because of drainage of their oil. For these reasons and others, Sinclair could not adhere to the plan. The hearing was then recessed until November 19.

This Week...

TRANSPORTATION.—Tax of 3 per cent on freight transportation, included in new tax bill, intensifies worries of oil industry, over costs of alternate traffic, without compensatory higher prices . . . Ground surveys under way for eastern extension of 24-in. line, other arrangements made to hasten completion by mid 1943 . . . Rail movement of crude and products east slumps to 759,233 bbl. daily, lowest rate since July . . . Plans completed to reverse three, possibly four lines from East Texas to Gulf Coast to supply capacity of War Emergency system . . . Around 100,000 to 120,000 bbl. daily of fuel oil will be moved from coastal refineries, through reversed lines, relayed through "big inch" system for ultimate delivery on East Coast. . . Coordinator Ickes now discussing second big line from Texas to Atlantic seaboard. . .

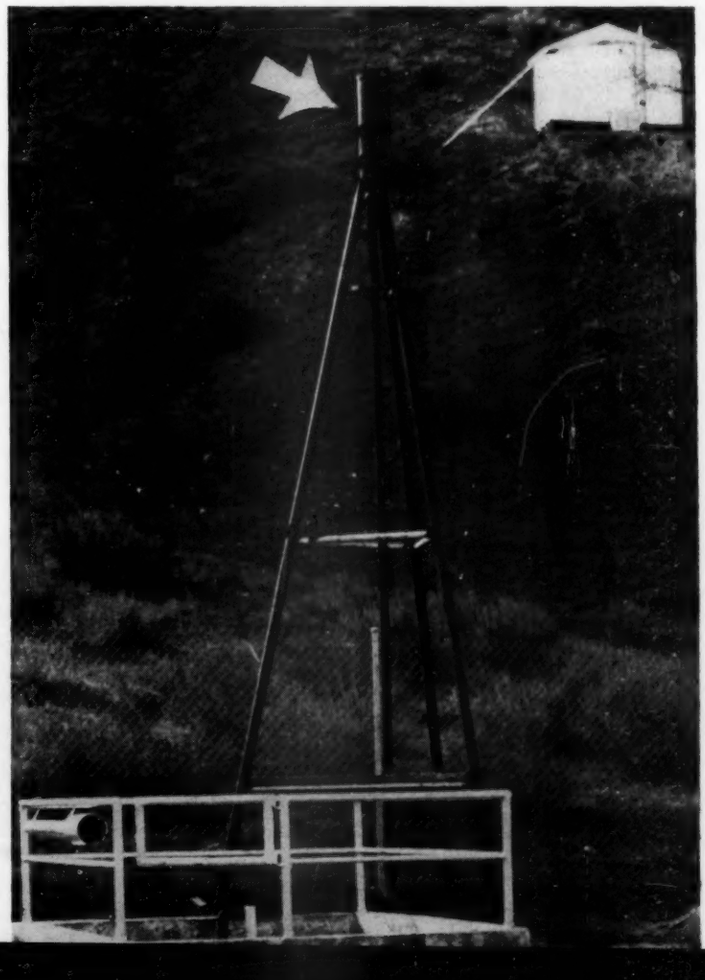
PRODUCTION.—Domestic crude-oil demand of 3,940,000 bbl. daily needed in November to meet requirements, estimated by Bureau of Mines . . . Crude demand continues higher because of slump in imports and greater offshore shipments . . . Railroad Commission recesses hearing on transferring allowables; meanwhile, engineers of commission and operators study problem at Kilgore, instructed to report at mid-November hearing at Austin, Tex. . . . Slump of discoveries, decline of exploratory drilling in South Texas indicate need for M-68 and material-priority relief . . .

REFINING.—Critical decisions face refiners. Conditions call for sharper swing to fuel-oil production, in eastern states . . . Available data indicate refiners continued gasoline production at approximately 39 per cent on crude charged through October. Actual yields contrast with PIWC recommendation of 35 per cent, Bureau of Mines calculation that 37.5 per cent should prevail in November . . . Specifications on pooled products for eastern shipment set up by OPC. Standards within reach of all suppliers . . .

MARKETS.—Specific prices set for residual fuel oil at Oklahoma, North-Louisiana and Wyoming refineries; slightly lower than spot quotations . . . Demand brisk for virtually all products, particularly fuel oils and natural gasoline . . . Crude buyers are intensively canvassing producers nearest Middle West refining centers and in fields with particularly desirable type of oil . . .

PRIORITIES.—Allocations of steel, copper and aluminum to oil industry placed under control of Leon Henderson; assigned task of coordinating civilian applications for these three critical metals . . .

RUBBER.—Construction under way on Sinclair Rubber, Inc., butadiene plant near Houston, Tex.; charging stock to come from Sinclair, Pan American and Crown Central plants nearby. . . . Shipbuilder Kaiser proposes 20,000-ton buna-S installation on West Coast, using benzol from steel mill coke ovens for styrene and alcohol from California wineries for butadiene . . .



This air-raid whistle, operating on high-pressure gas is installed at Southern California Gas Co.'s patrol station near Lebec, Calif. The whistle consists of a cylinder made of 8-in. pipe with a plunger which, when raised or lowered, varies the pitch or tone. It is mounted on a 2½-in. tripod and is operated by pressure from the 12-in. transmission line which is normally 210 lb. During blackouts and air-raid alerts the whistle serves the community of Lebec, surrounding ranches and traffic on the highway which passes nearby

A.I.M.E. Talks Feature Means To Improve Reservoir Control

By HARRY F. SIMONS

WITH a number of its members present in the uniforms of the Army and Navy as a grim reminder of the war, the Petroleum Division of the American Institute of Mining and Metallurgical Engineers met in Austin, Tex., October 29 and 30, to discuss the improvement in oil technology which will lead to greater and more economical recovery of this vital material. All of the technical sessions had a capacity attendance and discussion following delivery of each paper was both extended and lively.

Principal interest as shown by the number of papers relating to the subject and by the discussion following them, was in reservoir control and the behavior of the fluids under subsurface conditions. The program also included one general session devoted to Petroleum and the War on a banquet session at which E. L. DeGolyer, assistant deputy petroleum coordinator, related his experiences on his recent trip to Mexico to survey that nation's petroleum reserves and productivity capacity. In addition many of those at the meeting attended the dedication program at the new engineering building at the University of Texas.

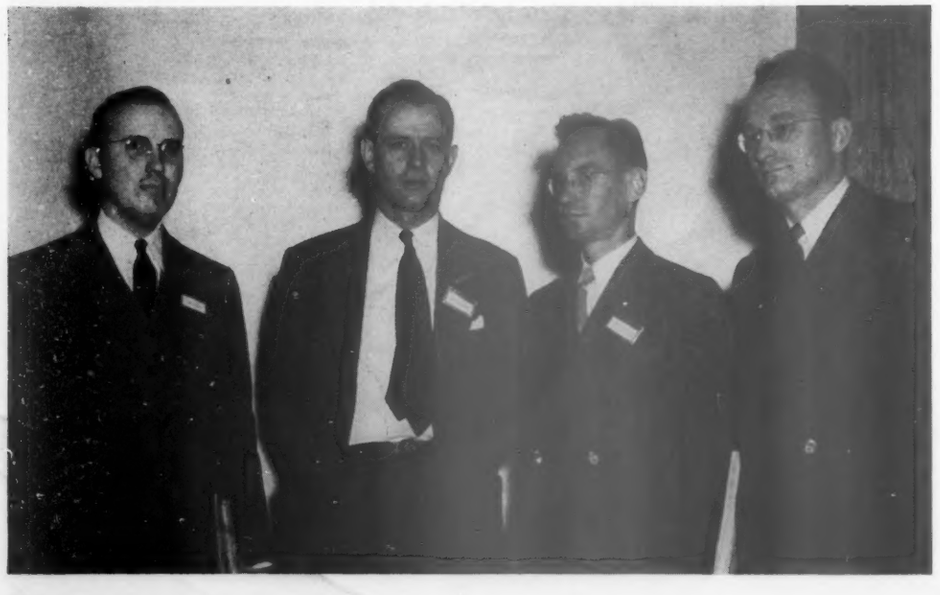
In his talk, "Interrelationship Between the Petroleum Industry and Our War Effort," Ray L. Dudley, president of the Gulf Publishing Co., pointed out that companies were now being permitted to act on a cooperative basis formerly denied them. He reviewed the various steps in the development of cooperation between the industry and Government and added that the interrelation was greatest in the refining branch. He remarked that the refining and rubber industries are further along the route to a satisfactory supply of rubber than is realized. Unfortunately, Mr. Dudley remarked, political Washington does not understand the oil business. After the war, the speaker said, we can hope for a return to economic freedom but this return is not assured.

R. J. Gonzales, Humble Oil & Refining Co., delivered the only other general talk, "Adjustments in Petroleum Industry Operations Incident to the War." He pointed out that an increase in efficiency and greater loading permitted the tankers to keep up with the East Coast demand but after war was started this situation changed.

Papers of interest to petroleum engineers and production men delivered at the Austin, Tex., A. I. M. E. meeting are presented as digests and abstracts on accompanying pages and on Pages 45, 47 and 48.

Right: Lt. Comdr. H. P. Stoltz, U. S. N., retiring chairman of the petroleum section of the A.I.M.E. with Maj. A. E. Sweeney, Jr., 142nd Infantry. Lieutenant Commander Stoltz was formerly a consultant in California and Major Sweeney was formerly instructor in petroleum engineering at the University of Texas

Below: W. A. Bruce, Carter Oil Co., who delivered a paper at the Friday morning session; C. E. Reistle, Jr., chairman, and S. E. Buckley, Humble Oil & Refining Co., who discussed the paper; and C. H. Keplinger, Shell Oil Co., Inc., cochairman.



Well completions for the present year will run about 55 per cent of that in 1941 but the percentage of dry holes will increase thus causing a further drop in oil completions. In a normal year, from 22 to 24 per cent of the wells will be dry holes but this will rise to 35 per cent during the present year. The increased ratio of dry holes is due to the smaller decline in wildcatting.

The peak in oil production was reached in 1941 when 4,100,000 bbl. daily was produced during the last quarter. During 1942 the average will probably be 3,800,000 daily, according to Mr. Gonzales. He pointed to Illinois as an example for conservationists stating that if that state had never been permitted to produce over 350,000 bbl. daily, it would still be capable of making that amount. The additional production would be of great importance at the present time.

The speaker reviewed the reserve picture showing that two-thirds of the reserves are located in District 3 while only one-half of the production is there. The Mid-Continent with 11 per cent of the reserves produces about 28 per cent of the nation's oil. Further comparison is afforded by the production of oil as a percentage of the reserves as District 3 produces only 5 per cent per year of its reserves while the Mid-Continent produces 17 per cent of its reserve annually.

As far as transportation goes, the speaker said, deliveries to the Atlantic seaboard are hampered by the bottleneck existing east of Chicago.

Peak tank-car shipment was reached in September when 856,000 bbl daily was delivered by this method 1 week. Now it is down to around 760,000 bbl. daily. The decline in tank-car shipments is due to the severe usage to which the rolling stock is subjected and to a number of wrecks.

Use of barges to relieve the situation is not particularly feasible according to Mr. Gonzales, because of a shortage of tug boats. Their speed

is very slow, averaging around 6 miles per hour.

Refinery operations reached a high of 4,000,000 bbl. daily during the fourth quarter of last year, were down to 3,500,000 bbl. daily during the second quarter of 1942 and are going upward now. The recent decreases have been in Districts 1 and 3. The refineries have made difficult adjustments to meet the demand for 250,000 bbl.

Phil Lehnhard, Dowell, Inc., Alec M. Crowell, director of conservation Arkansas Oil and Gas Commission, and Herb Beardmore, Amerada Petroleum Corp.

of aviation fuel but the control of prices is a definite handicap. Normally, Mr. Gonzales said, prices force adjustment and in times of emergency economic controls should be designed to help meet the shock of war rather than as a deterrent.

The retention of the present percentage-depletion allowance is also important as it takes care of the losses incurred in exploration for oil and otherwise the operating companies would have to obtain this money elsewhere. At present, prospecting costs in the neighborhood of $130,000,000 per year and elimination of depletion would practically amount to a raise of 10 cents per barrel in the cost of producing oil.

The Saturday morning session was devoted to papers discussing the resources and recent developments in the Texas industry. These included: "New Mineral Developments in Texas," by E. H. Sellards and V. E. Barnes, University of Texas; "Application of Natural Gas to Ferrous Metallurgical Operations," by H. B. Woods, Hughes Tool Co.; "The Electrolytic Zinc Plant at Corpus Christi," by George H. Cunningham, American Smelting & Refining Co.; and "Manufacture of Magnesium in the United States," by P. D. V. Manning, International Minerals & Chemical Corp

Chairmen and cochairmen at the various sessions included A. G. Loomis, Shell Development Co.; H. H. Power, University of Texas; D. L. Katz, University of Michigan; P. E. Fitzgerald, Dowell Incorporated; C. E. Reistle, Jr., Humble Oil & Refining Co.; C. H. Keplinger, Shell Oil Co., Inc.; Alexander Deussen, consulting geologist; C. A Warner, Houston Oil Co.; Paul Weaver, Gulf Oil Corp., and F. B. Plummer, University of Texas. Harry P. Stoltz, retiring chairman of the petroleum section, presided at the banquet and spoke briefly. Mr. Warner, incoming chairman of the section, talked briefly Saturday morning on the objectives and aims of the organization during the coming year.

ABSTRACTS--of A.I.M.E. Papers

THE EFFECT OF CASING PERFORATIONS IN WELL PRODUCTIVITY. Morris Muskat, Gulf Research & Development Co., Pittsburgh, Pa.

ANALYTICAL calculations have been carried out on the effect of casing perforations on the productivity of wells, and formulas have been derived for general types of perforation patterns The numerical calculations, however, show that the resultant well productivity is essentially independent of the perforation pattern, but is determined mainly by the total perforation density. Thus, for example, for a density of three perforations per foot of casing, the well productivity will be cut to one-third of that of the uncased well for a perforation radius of ⅛ in., and to approximately one-half for a perforation radius of ¼ in., regardless of the detailed manner in which the perforations are distributed over the casing surface. The analytical theory is also extended to include wells completed with slotted liners. It is shown that the reduction in productivity due to such liners will be relatively small as compared with that due to perforated casings.

●

RESPONSE OF A GULF COAST DRILLING MUD TO CHEMICALS, TEMPERATURES AND HEAT TREATMENT. George Fancher and Robert L. Whiting, University of Texas, Austin, Tex.

A TYPICAL drilling mud from the Hastings oil field, Brazoria County, Texas, containing only 8 per cent (dry basis) of material of colloidal dimensions, which is largely illite, was concentrated to a density of 10.2 lb per gal. and used in the study. The effects of water dilution, treatment with complex polyphosphates, temperature and the time of heating upon the rheological properties of the mud were investigated. It was found that water plays an important part in chemical treatment and that sodium pyrophosphate and sodium tripolyphosphate were more efficient than other complex polyphosphates for chemical treatment. Muds treated with either of these chemicals manifested maximum reduction in viscosity and minimum filtration rates at low concentrations. Furthermore, mud treated to minimum viscosity with either of these two chemicals, was virtually unaffected by heat treatment.

●

ANALYSIS OF RESERVOIR PERFORMANCE. R. E. Old, Jr., Core Laboratories, Inc., Dallas, Tex.

THROUGH the use of pressure and production records, formation properties and bottom-hole sample data, the performance of an oil reservoir may be studied analytically to define and evaluate the natural forces acting on and within the reservoir. Use is made of material-balance methods and the equation for natural water encroachment to estimate reserves. Methods for calculation of pressures are given.

A study of the Jones sand, Schuler field, Arkansas, has been made and is given to illustrate the value of the methods discussed.

●

PRESSURE DROP ACCOMPANYING ISOTHERMAL, TWO-COMPONENT, TWO-PHASE FLOW IN A HORIZONTAL GLASS PIPE. L. M. K. Boelter and T. H. M. Taylor, University of California.

MEASUREMENTS to determine the pressure drop in a system in which a liquid phase and a vapor phase flow simultaneously through a horizontal smooth pipe have been made.

Seven different liquids were used, with air in each case as the second phase. A total of 556 runs were accomplished.

The investigation is a part of a research program conducted by graduate mechanical engineering students at the University of California.

From these experimental results it is hoped that a general theory of two-phase flow can be developed, no only for the isothermal case, but also for the nonisothermal and the isothermal-compressible cases. Integration across the pressure-drop curves will be attempted in the future.

The experimental results demonstrate that a very large increase in pressure drop results from the addition of a small amount of liquid to a substantial flow of air.

Changing the surface tension of water by 36 per cent had no noticeable effect on the pressure drop, yet the character of the flow was very different. Thus the type of flow may not in itself be of primary importance.

The type of flow called "slugging" limited the range of the independent variables since certain combinations of air-liquid flow rates induced the phenomenon. For example, with a pressure drop of 0.15 $(lb./in.^2)$ $(ft.)^{-1}$ the cyclic function when "slugging" might be from minus 0.45 to plus 0.75, the period being about three-fourths of a second.

These experimental results have not yet been subjected to analytical treatment, and therefore generalizations based upon them are not justified.

●

THE ROLE OF CAPILLARITY IN OIL PRODUCTION. G. L. Hassler, E. Brunner and T. J. Deahl, Shell Development Co., Emeryville, Calif.

DATA are presented giving the capillary pressure-saturation relations for representative sandstones and dolomites, for both two-phase and three-phase conditions. A visualization of capillary forces in terms of round tubes is criticized, and a recommended alternative visualization in terms of capillary tubes of concave triangular section is recommended. Improved definitions of capillary pressure, threshold pressure and displacement

(Continued on Page 24)

STATE CAPITALS...

OKLAHOMA

THE CORPORATION COMMISSION has rejected suggestions that proration regulations be lifted from fields in the state which have been unable to produce their allowables for 6 to 8 months.

"If we were satisfied that the present fields were definitely moving out of the picture," declared Joe J. O'Loughlin, chief conservation officer, "we would take such action. But time and again in the past we have lifted restrictions only to have a revival in the area and result in a lot of 'back work' to get the records straight."

Several companies have made unofficial representations to the commission that the monthly reports on production and pipe-line runs are burdensome in view of the increased number of reports required by federal agencies. Relief from making reports to the state on fields unable to make their allowable would, the companies contend, lighten the burden of keeping exhaustive records.

CALIFORNIA

FURTHER REVISION of Conservation Order M-68, which was recently liberalized to permit the reworking of old wells, the installation of artificial-lifting equipment in heavy-oil fields, and the approval of many applications for exceptions depends upon the information developed from the current survey of pumping supplies now under way. The equiment survey is being made jointly by the Conservation Committee of California Oil Producers, the District 5 production committee and the Pacific Coast organization of the Office of Petroleum Coordinator. The survey, started about a month ago, is nearly completed, according to Lot Bowen, chairman of the committee. Data from individual operators are now being compiled by the California office of OPC, after which it will be forwarded to Washington, and used to substantiate further recommended amendments to Order M-68 so that full utilization of California's potential heavy crude-oil production can be realized.

R. P. Huggins, chairman of the conservation committee, this week stressed the urgency of appointing field engineering committees to assist in the development of allocation formulas in the various fields of the state, as well as to assist in the determination of the maximum efficient rate of production for the fields. The maximum efficient rate is used in calculation of the field allowable. A. C. Rubel, vice president of Union Oil Co. and chairman of the Oil Industry Protection Committee, reported on efforts to prepare the industry for any eventuality resulting from sabotage.

Mr. Rubel's committee has secured a waiver of the dim-out order in California, Washington and Oregon as pertaining to drilling wells or producers in California fields. Mr. Rubel told the military authorities in securing relief that at present there are approximately 102 drilling wells that would be affected by the order. In addition there are approximately 16,000 producing wells in the state, most of which operate at night without servicing but at times these wells need attention at night. Deferring the work until daylight would result in loss of crude-oil production necessary to maintain the quota set by the coordinator. The defense board, in granting the variation from the order, made it clear that lights must be shielded so no direct rays emit above the horizontal except that lights visible from above but not from the sea may be used while actually pulling or running pipe or rods. Total power of such lights must be limited to 200 watts and outdoor ground lighting kept to minimum as far as possible without reducing efficiency of protection. The order can be revoked at any time.

GASOLINE SALES, according to the California Board of Equalization, declined 10.77 per cent during September, compared with the same month last year. For the first 9 months of the current year, sales have declined 8 per cent. Sales during October will be about 10 per cent below last year.

LOUISIANA

ALLOWABLE PRODUCTION of 321,971 bbl. daily during November was established last week by the Department of Conservation. Allowable is split 233,904 bbl. daily to South Louisiana districts and 88,067 bbl. daily for North Louisiana fields.

The OPC certified daily production of 333,800 bbl. daily in Louisiana, including approximately 24,000 bbl. daily of natural gasoline and other liquid hydrocarbon products other than crude oil.

The Department of Conservation estimates that net crude-oil production of 321,800 bbl. daily will result from the new schedule.

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B. A. Hardey Joins OPC Staff As Louisiana Consultant

WASHINGTON, D. C.—B. A. Hardey, Shreveport, La., has been named a petroleum consultant on the OPC staff. He has been serving as chairman of the Louisiana State Mineral Board, and was formerly commissioner of conservation for that state. He will be stationed at Sherveport.

Mr. Hardey has 28 years' experience in the oil and gas industry, and has been in business for himself since 1931. He was with the production department of Gulf Refining Co. from 1914 to 1925, and later served as executive vice president of various subsidiary companies of the United Gas Co. and the Republic Gas Corp.

Mr. Hardey is a director of the Mid-Continent Oil and Gas Association, and the Independent Petroleum Association of America, and in recent months he has served as a member of the production committee for OPC District 3.

A veteran of the first World War, he commanded the 64th Antiaircraft Battery overseas, and was discharged as a captain, later achieving the rank of major in the Coast Artillery Reserve.

Ickes Reserves Judgment On Government Financing

WASHINGTON, D. C. — Petroleum Coordinator Ickes has indicated he is not 100 per cent in favor of the O'Mahoney committee suggestion that the Government reimburse wildcatters.

At his press conference, Mr. Ickes said he has not reached any definite conclusions as to the recommendation, although he has done considerable thinking about it.

There is "something to be said on both sides," he declared, but added that he believed such government aid might prove an "entering wedge" for government ownership of the industry, and asked, "what might be the next step?"

There has been very fine initiative shown on the part of the wildcatters so far, he asserted, and perhaps this incentive would not be needed.

Mr. Ickes has been outspoken in his support of the claim of oil operators that a crude-price increase would provide the greatest incentive possible for discovery of new reserves.

Specific Ceiling Price Set For Heavy Fuel in Three Areas

WASHINGTON, D. C.—Specific ceiling prices of 80 cents per barrel of No. 6 fuel oil in Oklahoma and North Louisiana-Arkansas and of 65 cents for the same material in Wyoming for delivery by motor transport or tank car were established October 29 by the Office of Price Administration. The ceiling price of 65 cents per barrel in Wyoming also applies to crude oil sold in that state as No. 6 fuel oil or its equivalent.

The ceiling prices were contained in Amendment 38 to Revised Price Schedule 88 and became effective November 4.

"Where the buyer and seller," states a portion of the amendment, "have agreed on a particular price subject to the approval of this office (OPA), the effective date of this subdivision shall be April 1, 1942, for deliveries under such agreement."

In another amendment to Schedule 88, the OPA set a maximum price of $1.53 per barrel at the receiving tank for crude distillate of 50 gravity and above from the Partlow lease, Hardin field. Liberty County, Texas.

Gulf Refiners Ask Governor To Seek Delay in Rationing

HOUSTON, Tex.—The Gulf Coast Refiners Association last week petitioned Gov. Coke R. Stevenson of Texas to seek delay or revision of the gasoline-rationing program through an appeal to the state's congressional delegation. The association specifically requested a delay of 90 days in the effective date of nation-wide rationing to determine whether present limits on automobile speeds and voluntary conservation would accomplish desired results.

D. W. Hovey, president of the association, advised Governor Stevenson that the organization he heads is opposed to the arbitrary coupon rationing system in states where supply is not a problem. The association recognized the necessity for conserving rubber but deplored the method adopted, which is an "apparent waste of manpower, materials, transportation and dollars."

the OIL AND GAS JOURNAL

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A Leadership Challenge

The membership of the American Petroleum Institute and the Petroleum Industry War Council meet next week at Chicago faced with decisions that will call for the best in industrial leadership. Before the meetings close there should be no question as to where this industry stands on those major questions affecting its all-important contributions in winning this war.

Fortunately from studies already completed the issues are clear cut. Furthermore from meetings held in recent weeks the position of the industry is known. The duty left to the Chicago assemblies is that of final coordination coupled with authoritative statements that will be heard and understood throughout this country, at Washington, and at all the other world capitals now allied in war against a common enemy.

There can be no further temporizing in the matter of what has to be done so that oil operators will be able to duplicate next year and later, their outstanding accomplishments during the first 11 months of this country's participation in the greatest conflict of all time.

This has been largely a year of delays and disappointments in the United Nations' conduct of the war but as a high official of the war department has said the reversals in no instance have been traceable to oil. The allied nations, as in the other war, have had oil when and where they could use it.

When it became apparent that air power was to be controlling in the war's course, refiners started manufacturing, in quantities which increase from week to week, a superior aviation fuel without which the Allies would not have obtained their present dominance in the air. The output of explosive materials from petroleum refineries in this country will shortly exceed the combined output of the Axis.

These same refiners are well on their way to closing the gap in the production of synthetic substitutes for natural rubber through the cutting off of which, the enemy had hoped to render ineffectual all the war plans of this nation.

The industry as it meets next week has every reason to be proud of these achievements the most outstanding of the war in many respects.

But operators can't stop here. The great danger of the future is that this industry and the war economy have been living off petroleum's prewar fat. Because the industry was prepared with reserves, manpower, facilities, and the know-how, Washington centered its attention on what it considered its more pressing problems.

This policy was wrong from the start and it can't go on. Established reserves are being depleted at the most rapid rate in the industry's history. Drilling operations have been halved. Despite what has been done in transportation that branch is still a cripple.

Refiners have concentrated on the production of war products paying little attention to their billion-and-half dollar investment in existing facilities which are the backbone of the industry's ability to manufacture military and civilian products.

If these oil trends continue this nation is faced with as critical a situation as if ship, tank and airplane construction and agricultural output had started to decline.

Remedies consist of adequate manpower, materials, and prices—each impotent without the others—plus centralized governmental direction. Washington's unwarranted actions have come largely from ignorance and the confusion of an overnight emergency. Partially they reflect a vicious attitude on the part of a few.

Regardless of consequences this industry can not lie down on the tens of thousands in the military services from its own ranks and from its own families, and millions of others who have started to take the war to the enemy on many fronts.

Action Delayed on Proposals To Centralize Oil Authority

By HENRY D. RALPH

WASHINGTON, D. C. — An executive order centralizing federal regulatory activities over petroleum matters is still under study and its announcement may be delayed for some time. President Roosevelt told his press conference last week.

This situation has led to the circulation of a number of rumors regarding the nature of the proposals which the executive office is studying. Most persistent is that it was proposed to make Secretary Ickes a member of the War Production Board and to make the Office of Petroleum Coordinator a branch of WPB. It is reported that Secretary Ickes opposed this plan and suggested as an alternative an order giving the petroleum coordinator full authority either to handle all details relating to oil or to lay down policies for other agencies to administer.

The suggestion for putting OPC under WPB follows a pattern which appears to be developing for centralizing all authority over war production within WPB. This was started by the report of the Baruch committee and the centralization of authority over the rubber program in William M. Jeffers as director under WPB Chairman Donald M. Nelson. While WPB did not physically take over the rubber activities of other federal agencies, Mr. Jeffers can determine policies and give orders to OPC, Rubber Reserve Co., Office of Price Administration, and other agencies.

Procedure Has Precedent

A somewhat similar procedure was followed when Ferdinand Eberstadt, who had been chairman of the Army-Navy Munitions Board, was named vice chairman of WPB. In this position he can coordinate, if not actually control, the procurement activities of the armed forces. More recently Mr. Eberstadt has taken over control of aircraft production for the Army and Navy.

Another current administrative problem relates to control of food production and distribution. A move is on foot to appoint a single food administrator to coordinate policies on production of food, lend-lease exports, food rationing and prices, production of farm machinery and food processing equipment, farm manpower, and similar matters. The Department of Agriculture wants this responsibility assigned to it, but current rumors are to the effect that an outside food administrator may be appointed to operate within the framework of WPB in the same way Mr. Jeffers does regarding rubber.

The OPC already has been designated the oil industry branch of WPB for purposes of materials priorities and allocations, and this arrangement appears to be satisfactory except that the oil industry is not getting as large quantities of materials as it desires. However, this complaint is common to all industries, and there is no reason to believe that if the petroleum coordinator were a member of WPB he could induce the board to allocate substantially increased quantities of steel and other critical materials to the petroleum industry when these must be taken away from the military and all other demands.

Simply to place OPC under WPB would not solve the industry's problems. Its chief problems have to do with prices, and this comes exclusively in the jurisdiction of OPA. The industry is asking higher prices for crude to stimulate discovery, higher prices for products which must be shipped by more costly methods than before the war, and higher prices for fuel oil to enable refiners to shift their yields to produce more burning oil and less motor gasoline. To date the OPA has not seen fit to grant any of these price-increase requests and price reliefs have been only local and minor.

The letter sent to the president late in October by retiring Rep. William P. Cole, Jr., of Maryland, pointed out forcefully the need for a centralized control of oil-industry regulatory matters and for an increase in oil prices. This letter, the pertinent portions of which were published in The Oil and Gas Journal, October 29, is expected to have considerable influence with the president in framing his anticipated executive order.

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Oil Industry Wages Frozen With Others By New Order

WASHINGTON, D. C.—Virtually all wage and salary payments are now frozen at their present levels and, with a few minor exceptions, may not be changed without the approval of either the National War Labor Board or the Bureau of Internal Revenue.

This is the effect of regulations issued October 27 by James F. Byrnes, director of economic stabilization, under the authority of the Act of Congress of October 2 and the executive order of October 3.

The regulations divide enforcement between WLB and BIR. WLB has jurisdiction over all wage payments and over salaries of $5,000 a year or less covered by collective bargaining agreements or where the employe is not in a bona-fide executive, administrative or professional capacity. BIR has jurisdiction over all other salaries. Both agencies will issue their own regulations and will establish branch offices, and branch offices of the Wage and Hour Administration will be used for disseminating information and answering questions.

Generally speaking, no wages or salaries may be increased above the level of September 15, 1942, without the approval of WLB or BIR. There are two general exceptions:

1. Employers of eight or fewer employes are exempt except that these may not pay any salaries above $25,000, and they are not exempt if wage rates were established by separate but uniform area, association or master contracts. The exemption applies to a total of eight employes, not to eight in single crew or branch office.

2. Individual pay increases can be made in accordance with prior agreements or established company policy as a result of individual promotions or reclassifications, individual merit increases within established rate ranges, operation of an established plan of pay increases based on length of service, increased productivity under incentive plans, operation of an apprentice or trainer system, and other similar circumstances which may be permitted by regulations to be issued by WLB or BIR, provided such increases do not make any substantial increase in the level of costs and are not used to justify higher price ceilings.

Christmas bonuses and similar extra payments will be permitted without specific approval if they are of a nature and amount customary in prior years and if they are not "unreasonable" nor used as subterfuges to evade the act.

Wages and salaries under $5,000 may not be reduced below the highest rate paid between January 1, 1942, and September 15, 1942, except "to correct gross inequities or to aid in the prosecution of the war," and then only with approval of the agency concerned. The agencies also have authority to order pay reductions for the same reasons. The only prohibition against reducing salaries over $5,000 is that no salary shall be cut to less than $5,000 per year without approval.

The act and regulations cover both individual and collective bargaining wage and salary agreements, so no individual employe can make any arrangements with his employer which would violate the law. Criminal penalties of $1,000 fine or 1 year in prison are applicable both to employers and employes. In addition, payments in violation of the act or regulations and rulings are to be disregarded by other government agencies in figuring price ceilings or costs under government contracts, and the entire salary payment, not just the illegal excess, is to be disregarded in computing business expense for income-tax purposes. Decisions as to facts are final and may not be appealed, though appeals may be made to the courts on questions of law.

Wage or salary agreements providing for automatic increases if the cost of living goes up may not be enforced without approval. New employes and new positions are also covered. A new worker may not be hired at a rate of pay higher than that established at that plant for similar work or skill. If the pay rate for a job classification has not been established for a given plant, the pay may not exceed that of similar classifications.

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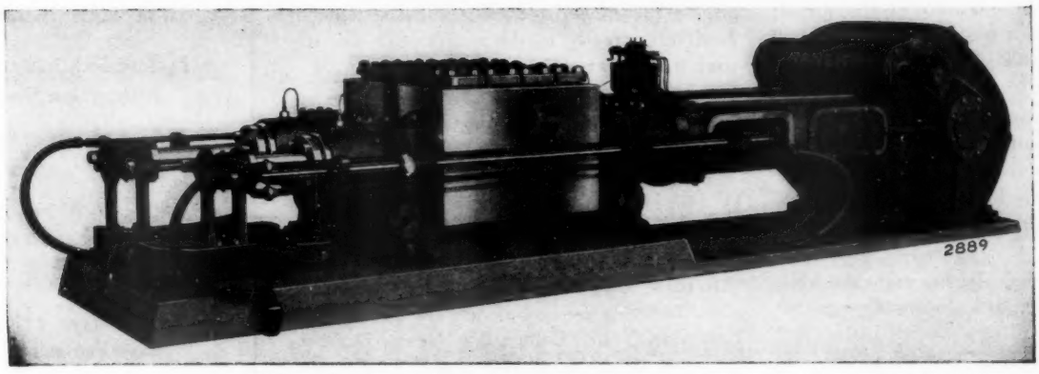

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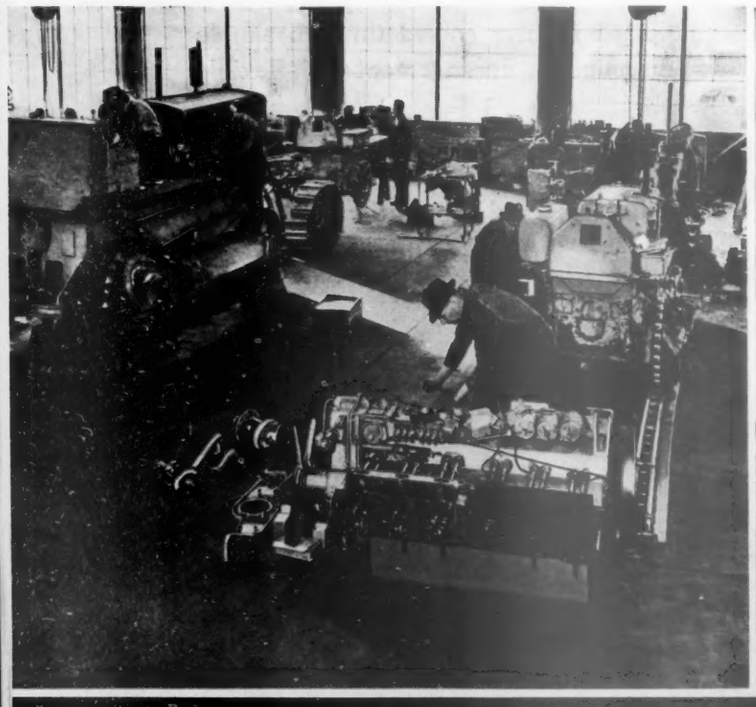

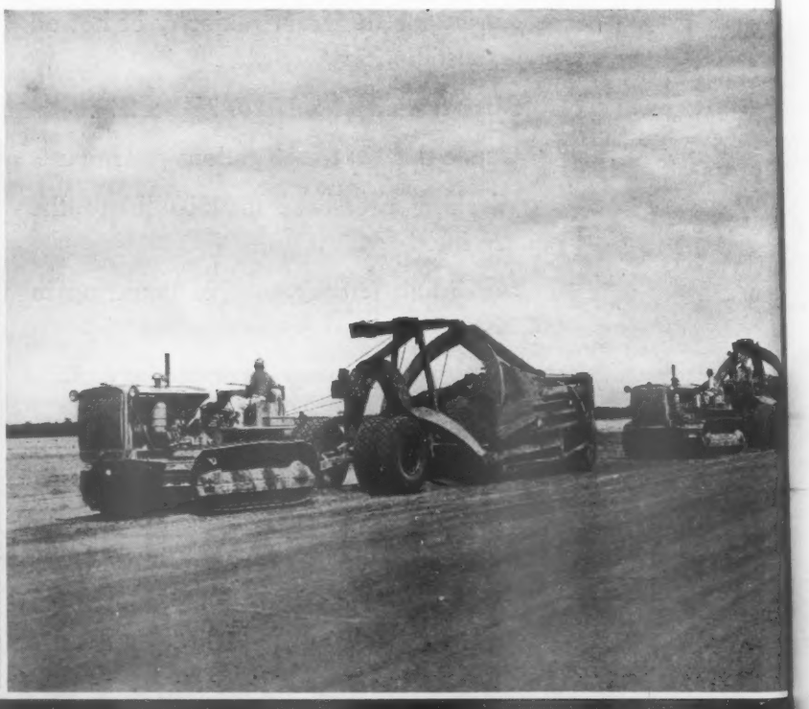

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Refiners Faced With Critical Decisions Concerning Yields

By H. STANLEY NORMAN

CRITICAL decisions on operating policies are on the November agenda of virtually every petroleum refiner in the country. Conclusions must be reached on many questions the answers to which have been deferred for months, pending clarification of the rubber program, mileage rationing, fuel-oil and gasoline curtailment and equipment allocations.

The most immediate problem is that of determining yields from crude processed in refineries whose principal outlet for manufactured products continues to center on civilian pursuits.

Gasoline consumption has consistently exceeded expectations of most economists and for this reason refiners have been delayed in a more extensive conversion to production of fuel oil as the principal finished product. There is convincing evidence at hand, however, which literally commands refiners to "get off the fence," so to speak, and take a stand in the direction most likely to preserve their relative positions in the manufacturing end of the industry.

Gasoline Yield Unchanged

Available data indicate that the rate of gasoline production on crude charged to refinery stills continued through the end of October at approximately 39 per cent which was the same ratio that prevailed in August, the last month for which Bureau of Mines figures are obtainable. By the middle of this month, however, most economists, including those attached to the Bureau of Mines, anticipate that the impact of nation-wide rationing of gasoline will react on refiners. Total motor-fuel demand in November is calculated by the Bureau of Mines at 49,500,000 bbl., about 13 per cent below the same month last year. The bureau conceded October 31, in its forecast of demand for November, that last month's consumption of gasoline exceeded the anticipated volume by a substantial margin.

Bureau of Mines estimates for the fourth quarter of this year indicate a decline of 7 to 8 per cent in the demand for all oils. The decline in total motor-fuel demand of possibly 15 per cent in the last quarter of this year, compared with 1941, is the cardinal factor in the reduced requirements for all oils. This means that approximately the 1941 rate of fuel-oil production must be maintanied by refiners of the country while processing an estimated average of 3,700,000 bbl daily against runs to stills of 4,051,300 bbl. daily.

In order to balance crude runs against demand for products in November, the Bureau of Mines calculates the gasoline yield at 37.5 per cent compared to actual motor-fuel recovery of 45.22 per cent a year ago. The bureau calculated gasoline yields in October at 38.3 per cent on crude. However, because the demand for motor fuel exceeded anticipations, refiners operated at a rate yielding approximately 39 per cent on the crude charged.

The abnormal factors influencing the gasoline demand in October and expected to continue through part of the current month emphasize the necessity for adjusting manufacturing operations to coincide with the indicated trend of consumption in December and through the first quarter of 1943. The necessary refinery-yield adjustments may be even more severe because of the advance dealer buying, assuming this has been a substantial factor in October and November demands on refineries.

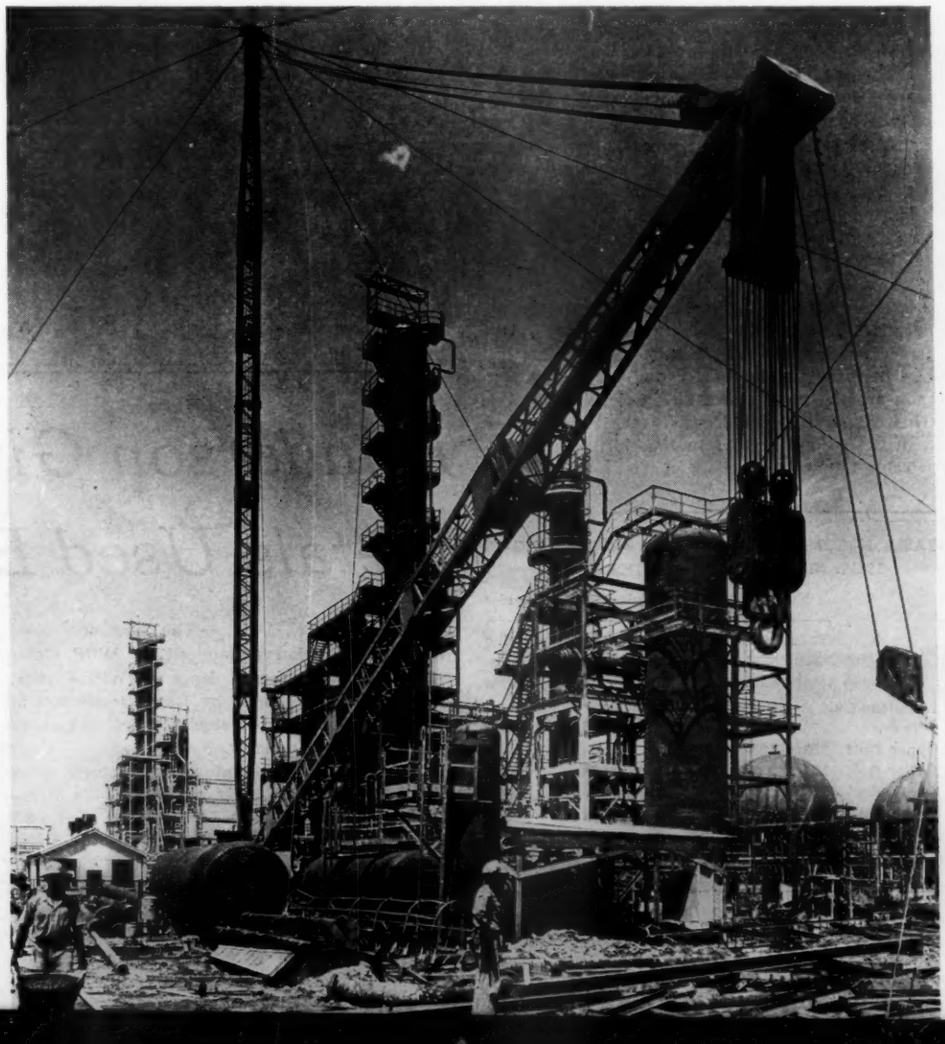
Frozen product prices have been the most significant deterrent to earlier adjustment of refinery yields. Refiners have generally maintained gasoline production at the highest level consistent with demand, facilities, available crude, transportation and other limiting factors. There has been no incentive, except suasion, to shift refinery operations from the manufacture of products selling at 5.75 to 6 cents per gallon to fuel oils quoted at a range of 2 to 4.375 cents.

Delay in the upturn of the gasoline-inventory curve this year, a trend that has been not particularly pronounced and one that may be overcome entirely before November ends, reflects the outlook for demand, economists contend.

The gasoline yield projected by the Bureau of Mines at 37.5 per cent on crude charged in November is more liberal than calculated by the Petroleum Industry War Council's economics committee Yields of 23 per cent of kerosene and light fuels and 27 per cent on residuals were projected by the PIWC committee to be accompanied by a reduction to 35 per cent on gasoline. The PIWC report was made early in October before the nation-wide gasoline rationing program had been full developed. Regulations on mileage rationing to go into effect November 22 are, if anything, more severe than anticipated a month ago, indicating that the PIWC calculations may be subject to further modification.

Demand for domestic crude oil in November, the Bureau of Mines estimates, will average 3,940,000 bbl. daily, a decrease of about 4 per cent compared with a year ago but nearly 100,000 bbl. per day higher than calculated for October. Reduced imports and increased exports are the chief factors in the relative static condition of domestic crude demand as opposed to a decline of about 9 per cent in the demand for all oils during the first 9 months of this year.

A new alkylation plant being constructed at one of the Standard Oil Co. (New Jersey) refineries. This plant will manufacture blending stocks which are mixed with aviation gasoline made from selected crudes



Exploration in South Texas Needs Strong Stimulation

By W. V. HOWARD

HOUSTON, Tex.—Wildcatting in the coastal area of Texas and Louisiana during the third quarter of 1942 was 40 per cent below the average quarterly level of 1941. Many reasons are advanced for this decline, of which the price of crude is now uppermost. Opponents of a price increase claim that the same low price did not affect wildcatting last year to which the reply is made that wages and costs have risen since then, there was no ceiling so that producers could at least hope for a price increase, and allowables have declined so that fewer barrels are produced and with a lower margin of profit per barrel the wildcatter cannot afford the gamble. To the argument that discovery wells are accorded higher allowables, the wildcatter replies that there is little use in getting more crude if he cannot sell the oil.

Conservation Order M-68 also takes a part of the blame for the current depression in wildcatting despite the fact that salt domes and highly faulted fields are exempt from its provisions. A discovery well will not necessarily prove that either structural condition exists and a number of discoveries are of a somewhat doubtful character so that stepping out ¼ mile or more becomes risky

Another factor that is causing a decline in wildcatting is a reduction in the number of discoveries. Last year, 13.2 per cent of the wildcats drilled produced either oil or gas. This year the percentage of successful wildcats has dropped to 8.1. The relationship between discoveries and new tests is demonstrated by the amount of activity in certain counties.

In Bee County, Texas, two fields were discovered in the first quarter of the year out of five wildcats. Four were drilled in the second quarter and five in the third. Jim Wells County, with two discoveries out of six wells in the first quarter has had six drilled since. Starr County, also with two discoveries in the first quarter has had 9, 13 and 7 wells drilled in each quarter, respectively. The relationship also holds in the upper coastal district. Jackson County has had one discovery each quarter and Mayo and Harmon are the most active new fields in the area. This county had 6 wildcats in the first quarter, 3 in the second and 11 in the third.

Table 1 shows the record of the area as a whole and Table 2 is a partial breakdown of activity by counties, only the more active ones being shown.

Record Dictates Changes

The record of 1942 to date, indicates strongly that something must be done to stimulate wildcatting on the Gulf Coast. The upper and lower Gulf Coast sectors have adequate reserves to tide them over a period of slackened exploration but that is not true of the remainder of the area, particularly of South and South Central Texas where the decline in exploration has not been noticeable. South Texas has some large fields in process of development, notably in Starr County, but most of the fields in that sector are approaching the stripper stage. In South Central Texas, they are already there. Coastal Louisiana has large probable, though undeveloped, reserves but drilling there to an average depth of 10,000 ft. in an area where exploitation costs are high because of the terrain is not attractive under present conditions.

It is perhaps significant that the decline in drilling varies as the distance to the principal markets with the upper Gulf Coast district showing an actual increase during the last quarter, almost equaling last year's quarterly average. Of the 36 wells completed from July to September in this district, 21 were in three counties, Harris, Jackson and Matagorda which have five of the six discoveries in the district so far this year.

TABLE 1—COMPARISON BETWEEN WILDCATTING IN 1941 AND THE FIRST 9 MONTHS OF 1942

	No. of wildcats completed					Discoveries	
		Avg. per	1942				Nine
	1941	1941	Jan.-	Apr.-	July-	Year	mos.
District—	total	quarter	Mar.	June	Sept.	1941	1942
Louisiana Gulf							
Texas	76	19	13	12	15	18	7
Upper Gulf	153	38	29	20	36	21	6
Lower Gulf	101	25	31	30	13	18	8
So. Central	101	25	17	10	7	6	1
South Texas	213	53	50	44	26	22	7
Total	644	161	140	116	97	85	29

TABLE 2—EXPLORATION BY COUNTIES AND DISTRICTS—FIRST 9 MONTHS, 1942—GULF COASTAL AREA

	Number of wildcats			Number of discoveries		
District and county—	Jan.-Mar.	Apr.-June	July-Sept.	Jan.-Mar.	Apr.-June	July-Sept.
Upper Gulf Coast:						
Brazoria	3	0	1	0	0	0
Fort Bend	3	2	3	0	0	0
Harris	2	5	5	1	0	0
Jackson	6	3	11	1	1	1
Matagorda	2	0	5	0	0	1
Wharton	2	4	1	0	0	0
Others	11	6	10	0	0	1
Total	29	20	36	2	1	3
Lower Gulf Coast:						
Bee	5	4	5	2	0	0
Jim Wells	6	2	4	2	0	0
Nueces	3	8	1	0	0	0
San Patricio	5	4	1	1	0	0
Victoria	3	4	0	0	0	0
Others	9	4	2	2	0	1
Total	31	26	13	7	0	1

	Number of wildcats			Number of discoveries		
District and county—	Jan.-Mar.	Apr.-June	July-Sept.	Jan.-Mar.	Apr.-June	July-Sept.
South Central Texas:						
Bastrop	3	4	0	0	0	0
Williamson	1	4	0	0	0	0
Others	13	2	7	0	0	1
Total	17	10	7	0	0	1
South Texas:						
Duval	12	12	7	0	0	2
Hidalgo	3	2	3	0	0	0
Jim Hogg	3	2	2	1	0	0
Live Oak	2	5	2	0	0	0
Starr	9	13	7	2	1	0
Webb	10	6	2	0	1	0
Zapata	5	0	0	0	0	0
Others	4	4	3	0	0	0
Total	48	44	26	3	2	2
Coastal Louisiana	13	12	15	1	3	2

Henderson Given Control of Metals Used By Industry

WASHINGTON, D. C.—The new controlled-materials plan announced by WPB Chairman Nelson November 2 places the WPB Civilian Supply Division, headed by Leon Henderson, in charge of allocations of steel, copper and aluminum for the oil industry.

Manufacturers of oil-industry equipment using these three products must make out bills of materials for all production to be scheduled each quarter. They will be processed by the Office of Petroleum Coordinator serving as an end-use branch of WPB, and the Civilian Supply Division will fit them in with allocations for all other non-military uses of materials.

The plan will become effective gradually through the first half of next year and will completely supplant the present priority system as to these three controlled materials on July 1, 1943 Priority orders such as P-98-b will remain in effect for the present. The new plan is not expected to affect users of materials for maintenance, repair and operating supplies, but manufacturers of these supplies and also new construction must come under CMP.

Converting for war

Concerning Uncle Sam's war program, someone recently said:

"The difficult thing we do right away; the impossible take a little longer" and it's borne out in war time experience of refiners

It is no easy task to convert the refining industry in a hurry from a motor gasoline-domestic furnace oil base to an aviation gasoline-synthetic rubber-toluene basis, but it is being accomplished step by step

Universal energy, experience and "know how" today are concentrated on the job of adapting the U.O.P. catalytic processes to fit as many refineries as possible, to make them effective in the overall war production program

That job is being done

OIL IS AMMUNITION — USE IT WISELY

Universal Oil Products Co
Chicago, Illinois

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Owner and Licensor

THE REFINERS INSTITUTE OF PETROLEUM TECHNOLOGY

Transportation Division of OPC Doing Vital Task

This is the fourth of a series on the organization, personnel, and functions of the Office of Petroleum Coordinator for War. Herein operations of the Transportation Division are described in detail. The author explains how the division has gone about its assignment of finding alternate transportation facilities for handling more than 1,250,000 bbl. of crude and products daily that previously moved by coastwise tanker routes.

The series started in the issue of September 3 with an analysis of the entire OPC organization. Detailed descriptions of the Production and Refining divisions appeared in the issues of September 10 and October 1, respectively.

By HENRY D. RALPH

WASHINGTON, D. C.—Most spectacular of all activities of the Office of Petroleum Coordinator are those of its Transportation Division.

To the public, oil means gasoline at the corner filling station and heating fuel in the basement. It was incredible to citizens of a country so rich in oil resources to discover that in the eastern states the gasoline and fuel oil were no longer available from their dealers as they always had been.

A tremendous cry went up, and congressional committees, municipal authorities, and other agencies started investigations. The answer was found to be simple — lack of transportation.

Simple, that is, in explanation, but far from simple in solution. Providing the solution has been the job of the OPC Transportation Division, and it has been a night-and-day job for more than a year for the score of experts in the division. Their work has been spectacular because it deals with things people can see and understand—ships, trucks, railroad cars, and barges—and because success or failure is so easily measured by the effects on the every day life of the individual.

Getting oil to the East was and still is the major problem of the division. Its success is attested by the fact that overland means of transportation has been found to supply most of the needs —not all, but the minimum essential needs—for petroleum products in the 17 Atlantic Coast states which comprise OPC District 1. Other duties of the division are to assist in routing American tankers to supply the needs of the United Nations and the outposts of our Army and Navy; keeping the right grades of crude oil moving into refineries and their petroleum war products moving out; getting oil to the Pacific Northwest when a tanker shortage threatened: keeping the oil industry's trucks in service; and, the latest problem, getting gasoline and fuel oil distributed through the West and Middle West which are facing a shortage of tank cars and tank trucks.

The magnitude of the problem of moving oil into the East is shown by a few figures. The 17 eastern states normally consume around 565,000,000 bbl. of petroleum products per year. They constitute a market for 39 per cent of the gasoline consumed in the United States, 46 per cent of the distillate fuel oil, 40 per cent of the residual fuel oil, and 64 per cent of the kerosene. Moreover, 85 per cent of the industrial fuel oil used in this area is consumed north of Washington, D. C. Before the war, 95 per cent of all this oil was moved in ocean-going tankers from the Texas and Louisiana Gulf Coast area. Diversion of tankers to military uses, and enemy submarine activities along the Atlantic Coast, have so reduced marine deliveries that ocean movement is no longer counted on for an important part of the supplies.

Alternate Accomplishments

To replace this heavy tanker movement, District 1 is now receiving daily in the neighborhood of 800,000 bbl. of petroleum and products by railroad tank car, 60,000 bbl. by barge via the Mississippi and Ohio rivers and the coastal canals, 60,000 bbl. in tankers and barges via the Great Lakes, and 125,000 bbl. by pipe line. Pipe line relocation projects now under way and scheduled for completion during the next few months will increase all pipe-line deliveries to a total of 208,000 bbl. per day, and when the 24-in. pipe line from Texas to Illinois is completed some time in December the shortened haul will permit the tank cars now in use to deliver an additional 100,000 bbl. daily. And currently, to cap the climax, a program is being put into operation for a supply and transportation allocation plan for all major companies marketing in the East,

Staff of the Transportation Division, Office of Petroleum Coordinator: (Seated) W. R. Lange, assistant director; Lee R. Cowles, assistant director; J. R. Parten, director; W. C. Kinsolving, assistant director; George A. Wilson, attorney. (Standing) J. A. Turner, chief, motor-transportation section; S. D. Archbold, chief, inland-waterway section; D. F. Sears, chief, pipe-line section, and Boyd Wilson, chief, tank-car section

which it is hoped will increase deliveries by another 75,000 bbl. daily through more efficient use of tank cars.

By the middle of next year, when the 24-in.-line extension to the East Coast is completed, efficiency of readjustments now completed and under way will be substantially enhanced. Accomplishments of the oil industry in overcoming the insufficiency of coastwise tankers and protection have been cleared through the Transportation Division and carried out under its guidance.

As the central clearing house for transportation problems of the entire oil industry, the division is broken down into sections dealing with pipe lines, priorities, tank cars, inland waterways, motor trucks, and tankers. At present the division numbers about 50 employes, of whom 28 can be classed as executives, plus a dozen in the five district offices, and expansion is planned in the near future. While there has been some turnover in personnel during the life of OPC, all the executives have been drawn from the oil industry with the exception of three or four who were recruited because of their special knowledge of certain problems.

Parten Succeeds Gilbert

The first director of transportation was H. A. Gilbert, who was president of the Oil Transfer Corp., of New York. When he returned to his business last spring the directorship was taken over by Maj. J. R. Parten, who had been president of the Woodley Petroleum Co. and chairman of the board of the Premier Oil & Refining Co., and who had been on the Tanker Control Board since the creation of OPC. There are three assistant directors, W. C. Kinsolving, who was general operating superintendent of the Sun Pipe Line Co.; L. R. Cowles, who was traffic manager of the Standard Oil Co. of Indiana; and W. R. Lange, who was assistant general manager of the marine department of the Standard Vacuum Oil Co. Also on the director's staff is a special assistant legal, H. T. Mather, formerly with Case, Pomeroy & Co., Inc.; a counsel assigned from the legal division, George A. Wilson, formerly with the Standard Oil Co. of Louisiana; and an administrative assistant, Miss Inez Fleming. Another special assistant with the title of transportation specialist probably will be named in the near future.

Most of the burden of the extensive pipe-line program of the division fell to the men in the pipe-line section, which is headed by D. F. Sears, who came from the Shell Pipe Line Co. Other executives in this section are J. E. Boice, for many years a pipe-line engineer in the Bureau of Valuation of the Interstate Commerce Commission, and C. H. Lundt, formerly with the Humble Pipe Line Co.

Greatest public interest in pipe lines has centered in proposals for a "big inch" line from Texas to the East, mapped out as the largest oil pipe line in the world. A 24-in. line clear to New York was proposed in June 1940, by Sec. Harold L. Ickes, long before OPC was established and when there was only a suggestion that loaning tankers to England might cause transportation difficulties for the Atlantic Coast area. It was not until a year later that the project began to crystalize. In the summer of 1941 Congress enacted the Cole pipe-line bill under which the president was authorized to issue certificates enabling pipe lines to condemn right-of-way, and at the prompting of OPC, 11 major oil companies formed the National Defense Pipe Line Co. to construct a 24-in. crude line some 1,500 miles long. Engineering and other plans were well advanced when, on September 16, the old Supply Priorities and Allocations Board refused to grant the necessary allocation of steel.

While steel undoubtedly was tight at that time, even though we were not yet at war, this decision can be attributed partly to special interests and partly to a general failure to appreciate future problems. Except for Secretary Ickes, few officials foresaw the possible loss of tankers through diversions and war activities. The railroads continued their traditional opposition to competitive means of transportation, the Maritime Commission insisted that the steel could be used to better advantage in building tankers, and many people felt that the major oil companies must have some ulterior motives in proposing the big line.

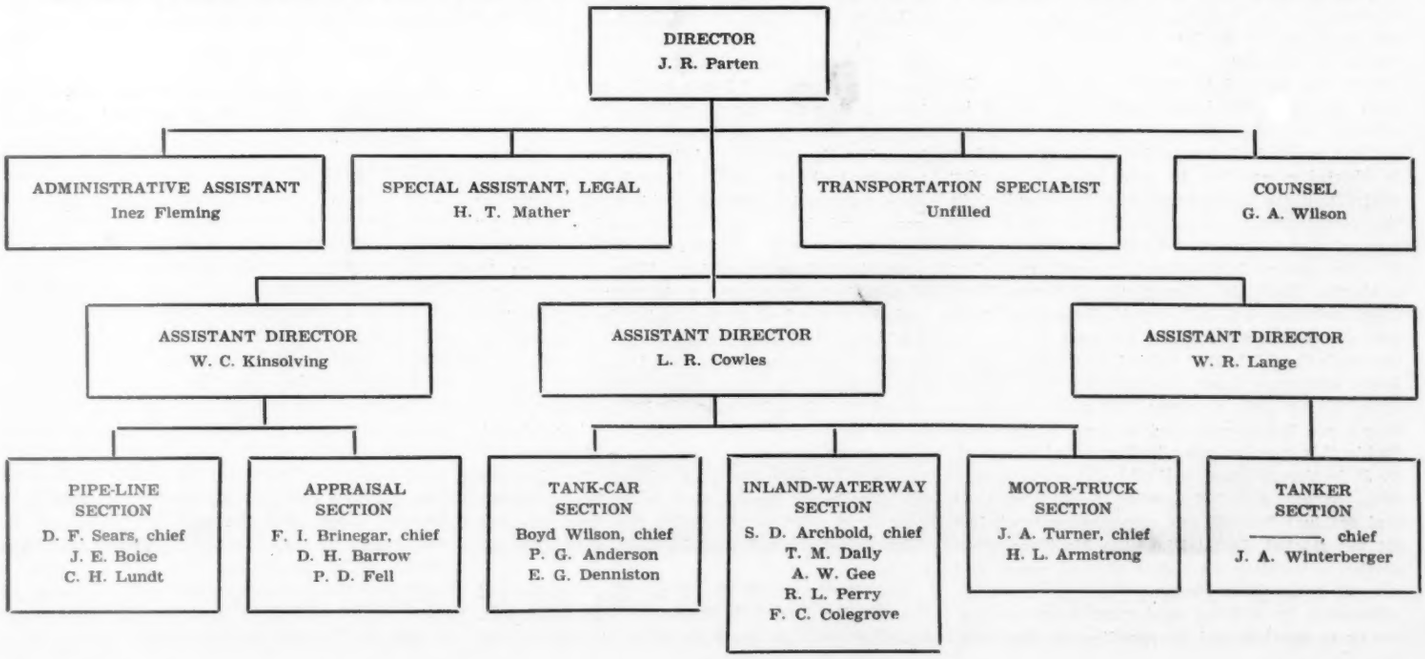
But Secretary Ickes stuck to his theme song, "You can't sink a pipe line," and the OPC kept going back with requests for reconsideration. Additional engineering studies were made which resulted in very considerable reductions in the estimates of the amounts of critical materials needed in construction of the line. A proposal to build the line of seamless tubing instead of plate was turned down November 5. Plans were redrafted to cut steel requirements even more, but this also was denied on February 28. Finally, when the critical supply situation on the East Coast became apparent to all, the War Production Board, on June 10, 1942, granted priorities for 350,000 tons of 24-in. seamless tubing, sufficient to build a line 550 miles long from the East Texas field to southern Illinois. A new corporation, War Emergency Pipelines, Inc., was formed, and work began immediately. WPB authorization last week to use steel to complete the "big inch" line to the East Coast clears one of the most formidable hurdles in the readjustment program.

Meanwhile, the transportation division fostered plans to dig up old pipe lines and relay them in other sections of the country, to convert, reverse, and connect existing lines, and to form a new network capable of pumping oil from the southwestern producing areas to the eastern consuming region, all with relatively small amounts of new equipment or critical materials.

Relocation Program Launched

With the plan roughed out boldly, the transportation division called a general conference in Tulsa in March to which 70 pipe line companies sent representatives. The industry was told that pipe lines would have to be relocated to pump oil to the East, and that the details were up to it. There was a lot of sweating, but the industry responded, and came out with an ambitious and detailed plan. The plan required some companies to abandon lines and turn material over to others, it involved shifting markets, reversing the flow of some lines, cooperative construction and operating ventures, and the investment of huge sums of money in projects which might be of little or no value at the end of the war. The Petroleum Industry War Council endorsed the plan in principle and appointed a temporary joint pipe-line subcommittee for Districts 1, 2, and 3, to make further studies. Management and engineering committees were created for each project, and in June OPC issued Directive 49 approving a revised version of the industry's plan and

ORGANIZATION CHART OF TRANSPORTATION DIVISION, OFFICE OF PETROLEUM COORDINATOR



directing the oil industry to put it into effect.

Work began at once, and is now well advanced. The plan calls for digging up a relocating 1,700 miles of second-hand pipe, laying a total of 830 miles of new line in addition to the Texas-East Coast "big inch" system, reversing and converting 2,600 miles of other lines, and installing additional pumping equipment and storage facilities. The major portion of this is being financed entirely by the oil industry, though the Defense Plant Corp. is paying for three of the relocation projects.

Getting priorities for materials for all forms of transportation used by the oil industry is the job of the appraisal section, formerly called the priorities section. Until he became a major in the Army, this section was headed by C. L. Lockett, formerly with Standard Oil Co. (New Jersey), and is now headed by F. I. Brinegar, formerly with Continental Supply Co. He is assisted principally by D. H. Barrow, formerly construction engineer of the Southern Kraft Corp., and P. D. Fell, formerly with the pipe-line division, Sinclair Refining Co. This section passes initially on all applications for priorities for materials to be used in oil transportation filed under the requirements of Conservation Order M-68 and Preference Rating Order P-98-B, and also PD-200 applications for new capital expenditures. One of its biggest tasks was clearing project ratings for the pipe-line relocation program. It also has the duty of forecasting future materials requirements for the transportation branch of the oil industry.

Wilson Supervises Tank Cars

The tank-car section is headed by Boyd Wilson, formerly with the Pennsylvania Railroad Co., assisted by P. G. Anderson who was traffic manager of the Lion Oil Refining Co.

When transportation difficulties came to public attention there was a demand to know why inland waterways could not take over much of the burden, and this is the job of the inland waterway section of the division. The chief of this section is S. D. Archbold, who came from the Standard Oil Co. (New Jersey). Others in this section are T. M. Daily, from the Premier Refining Co.; Alden W. Gee, from the Major Petroleum Co.; R. L. Perry, from Socony-Vacuum, and F. C. Colegrove, from the Western Oil & Fuel Co.

The inland waterway section was unable to show such spectacular results as the tank car and pipe-line sections because of the physical impossibility of building sufficient new barges and towboats to utilize the rivers and coastal canals to capacity.

OPC has refused to recommend priorities for steel for new tank barges, believing this an inefficient use of steel under present conditions, but has assisted oil companies and barge builders in obtaining supplies to complete work under contract. Since last spring, this has resulted in the completion of about 40 barges for private account and 16 are now under construction and 17 more are under contract, as well as a few towboats. Early in August the Defense Plant Corp. announced that it would finance a barge conversion and construction program in cooperation with the OPC, ODT, Inland Waterways Corp., Army Engineers Corps, and Smaller War Plants Corp. Under this program 130 steel dry-cargo barges are being converted to tank barges, and double this number may be converted eventually. It is also planned to build 400 wooden dry-cargo barges and 500 wooden tank barges to haul residual fuel oil, but construction work has not yet started. In addition, the Maritime Commission is building a number of steel, wood, and concrete ocean-going barges.

However, by shifting equipment from one waterway to another and by speeding up the service generally, the eastward and northward movement of oil has been greatly increased. Great assistance in this has been given by the industry's joint barge subcommittee for Districts 1, 2, and 3, and by Order 19 of the Office of Defense Transportation which has legal authority to control the movement of all craft on inland waterways. Another part of the program involved shifting the routes of tankers and barges on the Great Lakes to move more oil to the Buffalo area. When the Trans-Florida pipe-line project is completed 35,000 bbl. of oil daily will move north up the Atlantic coastal canal as far as Virginia.

Motor Transport Section

The motor-truck section of the transportation division is headed by J. A. Turner, formerly with the American Trucking Associations and the Michigan Trucking Association. He is assisted by H. L. Armstrong who came from the Skelly Oil Co. The diversion of tank cars to eastern service and the prohibition on using them for short hauls has required a rearrangement of the services of the oil industry's tank trucks to make up for this lost rail haul. While these are chiefly local problems, the motor-truck section has assisted in increasing the efficiency of existing tank-truck equipment by rearrangement of shipping schedules, pooling equipment, and eliminating unnecessary delivery schedules and special shipping services. By taking over deliveries formerly done by tank car, trucks have made it possible for tank cars to move some 200,000 bbl. per day into the Atlantic Coast area.

In addition, the motor-truck section works closely with the ODT and with the ICC in matters of rates, routes, and exemptions from restrictive regulations.

Continued efforts have been made to secure uniformity of state and municipal regulations, particularly those concerning the size of trucks and weight of loads which they may carry. Temporary transfers have been arranged of tank trucks from areas with surplus equipment to areas short of equipment.

Little can be said about the tanker section, not because it has done little but because everything it has done is shrouded in the cloak of military secrecy. For obvious reasons the number of tankers in service, their routes of operation, and their whereabouts and movements cannot be made public.

When OPC was organized, in the early summer of 1941, the tanker section was concerned chiefly with increasing the efficiency of privately owned and operated boats in the coastal service, by speeding the turnaround time and using the most efficient routes. A number of tankers were loaned to the British, and the operators of the remaining tankers in the Gulf-North Atlantic coastal service formed a pool to divide available tanker space equitably. A tanker control board, jointly representing the Government and the owners, supervised these operations. When war was declared the Government took over all shipping, and the method of control had to be revised. The Tanker Control Board was changed to the Tanker Coordinating Board, and this later gave way to the present Petroleum Supply and Distribution Board. This board is composed of representatives of the OPC, Army, Navy, War Shipping Administration, and the British Petroleum Mission. Since its operation is primarily a military function, the industry is not represented on it. Tanker operators serve only as agents for the War Shipping Administration, and use the tankers as directed by it.

The chairman of the Petroleum Supply and Distribution Board is Ralph K. Davies, deputy coordinator; vice chairman is B. B. Jennings of WSA, and the executive secretary is W. R. Lange, assistant director of the OPC transportation division, formerly in charge of Far Eastern marine operations of the Standard-Vacuum Oil Co. The duties of the board are to allocate tanker movements to supply petroleum products to the Atlantic and Pacific coasts of the United States, Canada, Latin America, the United Kingdom, the Near East, the Far East, and, in conjunction with Navy-owned tankers, Army and Navy bases throughout the world. Actual dispatch of ships is the province of the Navy and WSA, but the Petroleum Supply and Distribution Board supplies the basic figures on supply and demand and maps out the directional flow of movement of petroleum products. Not the least of its problems is to dovetail into this shipping schedule the dispatch of tankers to Gulf Coast refining centers to prevent petroleum war products from piling up in storage and threatening refinery shutdowns.

The tanker section of the Transportation Division is currently being reorganized and expanded, and at present its principal executive is J. A. Winterberger, formerly with the Gulf Refining Co. The duties of this section are largely to serve as the staff for Mr. Lange in his capacity of executive secretary of the board in planning and arranging for the directional flow of petroleum products throughout the seven seas.

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Abstracts of A.I.M.E. Papers

(Continued from Page 13)

pressure are presented. The concept of capillary hysteresis is widened to include "trap" as well as previously accepted "optional" hysteresis and these terms are defined.

The various occurrences of the displacement pressure phenomenon as a maximum threshold pressure, as a minimum capillary pressure and in the Bartell cell are discussed. The theory of capillary flow at the outlet boundary is developed to reveal the occurrence there of a pressure discontinuity in the nonwetting phase equal in value to the capillary pressure at critical saturation.

An outline of the subject of capillarity from the point of view of exploitation engineering is presented, with brief mention of the special problems of oil accumulation, the equilibrium vertical distribution of oil and multilayer flow.

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MUD ACID—ITS THEORY AND APPLICATION TO OIL AND GAS WELLS. Phil J. Lehnhard, Dowell Incorporated, Tulsa.

THIS paper shows that large increases in the productivity of sand wells treated with mud acid, are due to the reduction or elimination of abnormally high pressure drops near the bore hole of the well; and that only small increases in productivity may be obtained in most instances unless such abnormal pressure drops occur. It is shown that some oil sands contain clay or bentonite material which has the ability to hydrate or swell when in contact with water, and that hydration of such materials in the sand will cause a reduction in its permeability. The paper points out that screens or perpetual liners, gun perforations, and hydration of clay materials in the sand near the bore hole may all cause abnormally high pressure drops near the well.

It is also intended that the paper should be a resume of field experience with mud acid to date, together with conclusions reached as a result of more than 2 years of the commercial application of mud acid to oil and gas wells

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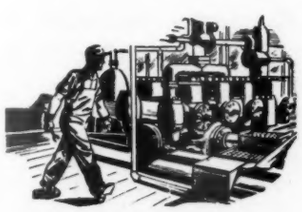
Hycar is supplied as crude synthetic rubber to the manufacturer of finished rubber products. Your rubber supplier can show you Hycar in many types and forms. Hycar maintains research laboratories and field engineers to cooperate with users and suppliers to determine and control the physical properties needed for any specific application. HYCAR CHEMICAL COMPANY, Akron, Ohio.



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LARGEST INDEPENDENT PRODUCER IN AMERICA OF BUTADIENE SYNTHETIC RUBBER

Industry Is Nearing Limit in Sacrifices of Technical Men

By F. L. AURIN
President, American Association of Petroleum Geologists

As time goes on, the demand for geologists and geophysicists in military and civilian activities directly connected with the war effort is rapidly increasing, and the time may not be far distant when the petroleum industry will not be able to give up many more of these technically trained men. Some of the oil companies and other operators have already lost so much personnel that further depletion of their key men (both company and independent consulting) in both geological and geophysical activities will seriously handicap their exploration programs. Such situations must be avoided, as it is absolutely necessary for the petroleum industry to explore, prospect, and discover substantial new reserves. Such necessity is not confined to the United States but is also applicable to other areas and countries strategically located where the discovery and utilization of petroleum in our war effort is essential.

Senator O'Mahoney, chairman of the subcommittee of the Senate public lands committee, after a recent hearing, stated: "The undisputable facts revealed by these hearings are that production of oil has been falling off, wildcatting, or the search for new fields, has nearly ceased, while the growing war demand may well deplete our known reserves, endanger the conservation policy, and, in time, force us to turn to oil shale and coal for petroleum substitutes."

The Office of Petroleum Coordinator for War, through Harold L. Ickes and others in his organization, has also repeatedly pointed out the fact that the downward trend of new discoveries and the present scarcity or dearth of new exploration and discoveries has reached a critical stage, and that something in the way of a constructive program of cooperation and encouragement must be established to stimulate the exploration work for new fields. It is absolutely necessary that this program of new exploration be carried out in order to guarantee the fulfillment of the entire war effort. We have the strongest hope and trust that it will be carried out. When this program gets under way, it will tax the skill, ingenuity, imagination, and resourcefulness of all petroleum geologists and geophysicists, who will be the directors and have the responsibility of carrying out this important assignment to a successful conclusion. Then, as previously stated, the petroleum geologist and geophysicist must be left in a position to perform this duty. Even though these key men (both company and consulting) and the local draft boards in many cases, feel that their places are in the military service, yet they are just as patriotic and are doing a greater service to their country if permitted to stay in their present work and do their utmost to discover and develop new reserves.

Editor's note.—The above article by Mr. Aurin will appear in the November issue of the A.A.P.G. Bulletin and was made available to The Oil and Gas Journal because of its timeliness and general interest in connection with the current attention surrounding the entire question of manpower.

Two Bureau of Mines Reports Discontinued for Duration

WASHINGTON, D. C.—Bureau of Mines has discontinued two of its regular petroleum reports, and at the same time has announced that the distribution lists of at least three others will be curtailed in line with government policy involving dissemination of data which might be useful to the enemy.

The two reports which have been discontinued—for the duration at least—are the semiannual motor-gasoline survey, summarizing physical and chemical properties of gasoline produced by United States refineries, and the list of petroleum refineries, including cracking plants.

Lists to which the three monthly reports—International Petroleum Trade, Crude Refinery Report, and Mineral Trade Notes—will be distributed in the future are being pared, it was said, and these statements will go only to a small groups of persons, most of them within the Government.

Floods and Car Diversions Reduce Rail Movement of Oil

WASHINGTON, D. C.—Heavy floods in the Potomac River Valley and throughout southern Virginia retarded the tank-car movement of petroleum and dropped shipments to 759,233 bbl. a day during the week ended October 24.

Daily shipments were down 9.4 per cent from the previous week—to the lowest level since the week of July 18.

"The floods in the East cut down both the movement of loaded tank cars into the Atlantic area and the return of empties to shipping points in the Southwest," Deputy Petroleum Coordinator Ralph K. Davies said. "And, approximately 2,000 tank cars previously in service to the East Coast have been temporarily called back to Midwest service to meet fuel-oil transportation needs in that area. These are the primary factors responsible for the reduced shipments."

In shipping 759,233 bbl. of oil daily last week, 39 companies loaded 25,069 tank cars—slightly more than one-third of the total cars counted in East Coast service on the first of the month.

On the basis of 212 bbl. per car average, the rail shipments for the week amounted to 5,314,628 bbl. of petroleum and products.

New Freight Tax Intensifies Oil Transportation Problem

WASHINGTON, D. C.—The primary worry of the oil industry over the new tax bill—aside from the 1.5-cent increase in the excise tax on lubricating oil—is centered in the 3 per cent tax on freight transportation.

With about 800,000 bbl. of petroleum and products moving into the East Coast area by rail every day (not to mention the movements in other sections of the country) it's hard to calculate how this new tax will be adjusted to tie in with the Government's efforts to get oil to the East Coast by rail.

As far as the 1.5-cent increase in the excise tax on lubes is concerned, the industry seems lackadaisical, since the consumer will pay the cost—it will make the tax 6 cents a quart.

The new transportation tax applies to transportation other than pipe line, and may have a beneficial effect on applications for new pipeline transportation facilities.

No change has been made in the tax law as it affects excises on gasoline, and greases remain tax free. As has been reported before, there is no change in the depletion allowance or the provisions of the tax laws permitting different types of chargeoff for intangible drilling and development costs.

The Office of Petroleum Coordinator is working on the new transportation tax, to see how it affects the oil-supply outlook in the East.

Most Oil Equipment Exempt From Tightening of Order M-21-b

WASHINGTON, D. C. — Iron and steel warehouses, which for some time have been permitted to make deliveries on A-1-a and higher rated orders, were instructed last week by the Director General for Operations to accept no orders rated lower than AA-5.

This action, taken to prevent the serious depletion of warehouse stocks of iron and steel products, is contained in Amendment 7 to M-21-b. The amendment lists the following exceptions to the above provision:

1. For essential repair and maintenance purposes, alloy iron and alloy steel can be delivered on A-1-k or higher rated orders. Such deliveries are restricted in any one quarter to 3 per cent of the warehouse's quota for alloy (including stainless) and tool steels, and 5 per cent of the quota for other iron and steel products (or 150 tons per quarter if that figure is greater).

2. Plate ends and short sheets, commonly known as wasters, can be delivered on A-1-k or higher rated orders.

3. Tubular products and wire rope can be delivered on A-10 or higher rated orders. This exception applies to most materials available under Preference Rating Order P-98-b.

4. Nails, bale ties, and similar wire products, as well as roofing and siding sold primarily to the farm trade, can be delivered without a preference rating.

The amendment continues the provisions of the order which forbid delivery of carload lots from warehouse stocks, except in the case of mixed carloads.

Geologists to Discuss Reserves at A.A.P.G. Meeting in Fort Worth

Discussions of the problem of how to find new reserves during the emergency to assure that the United Nations will have adequate oil will feature the annual meeting of the American Association of Petroleum Geologists, which will be held April 7, 8, and 9, at Fort Worth, Tex. The announcement that the annual meeting would be devoted to promoting the war efforts with special emphasis on new reserves was made by F. L. Aurin, of Southland Royalty Co., Fort Worth, president of the association.

The Society of Exploration Geophysicists and the Society of Economic Paleontologists and Mineralogists, associated organizations of A.A.P.G., will hold their annual meetings at Fort Worth during the same period.

PIWC WILL SEE DEMONSTRATION OF TUBELESS TIRE

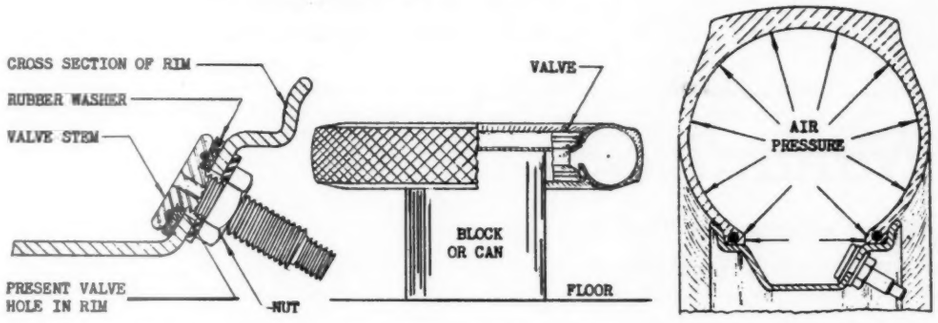
PLANS have been completed to conduct a demonstration before the Petroleum Industry War Council next week at Chicago showing the use of the tubeless tire. The council is holding its regular November meeting Monday and Tuesday at the start of the annual meeting of the American Petroleum Institute, November 9-13.

Approximately 600 tires with the tubes removed are being used in the Tulsa area. Some of the tires have gone as far as 12,000 miles under varying operating conditions, including high speeds. The development has been sponsored by John B. McGay, Tulsa manufacturer, who became interested in its possibilities as a rubber-conservation measure.

Inflation of tires without tubes is adaptable to most types of tires and rims. The procedure necessary to change to the tubeless tire is explained in the accompanying diagram. In some cases a fluid is placed in the tire to assure that the tire will give satisfactory service. Those who have used the tires state that inflation requirements are practically the same as with inner tubes.

Mr. McGay has used the tubeless tires with a large passenger automobile and has had no tire troubles in driving 5,000 miles. Glen Ames, manager of the Tulsa marketing district for Phillips Petroleum Co., has also used the tubeless tire in several thousand miles of driving.

Several oil operators in the Tulsa area are particularly interested in the development because of its possible relationship to gasoline rationing. It is estimated that at this time approximately 200,000 tons of rubber are represented in tubes. It is pointed out that with the general use of the tubeless tires a large part of this tonnage could be reclaimed and reused in the manufacture of casings. It is contended that this would aid materially in spanning the rubber-shortage gap until synthetic-rubber supplies are made available in sufficient quantities to offset the loss in natural rubber.



No. 1 *No. 2* *No. 3*

These drawings illustrate how to mount any casing directly on a drop-center rim without inner tube. First, remove casing and tube from rim, inspect inside of casing and repair holes or slight breaks in fabric. Vulcanize patch any larger holes or breaks. Clean bead and sand smooth any rough places. Clean inside of rim. Insert valve in hole in rim as shown in Fig. 1. Mount casing on rim and press outside tire bead as far as possible on its rim shoulder as shown in Fig. 2. Place wheel on block, and remove valve core so that air may be applied quickly. Apply air at same time beating on casing lightly with hand or mallet so that lower bead will contact with rim and form seal. As soon as casing snaps into place on rim apply valve core and bring up to normal pressure. Submerge whole tire and wheel in water and check for leaks. Best results can be obtained by putting into the casing 1 or 2 qt. of tire-sealing fluid. Fig. 3 shows cross-section of tire without tube mounted on rim. Note that air pressure forces effective seal between smooth tire bead and smooth steel rim

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Sabotage Declared Greatest Threat to Oil Facilities

CHICAGO, Ill.—A warning that sabotage is the greatest potential threat to the wartime security of petroleum-industry installations was sounded here last week at the annual meeting of the Petroleum Section, National Safety Congress.

Potential danger from operations of saboteurs were outlined by L. S. Wescoat, vice president and secretary of the Pure Oil Co., Chicago, and chairman of the Great Lakes region committee on protection of petroleum facilities. Mr. Wescoat urged the petroleum industry to resolve its entire personnel into organizations for protection of plants.

H. T. Markee, Phillips Petroleum Co., Bartlesville, Okla., was elected general chairman of the Petroleum Section for the ensuing year.

Lack of foresight by some people handling priorities in Washington was blamed for the current imposition of rationing on petroleum products by B. L. Majewski, vice president of the Deep Rock Oil Corp., and chairman of the OPC District 2 marketing committee. Mr. Majewski, speaking before a luncheon meeting of the congress, pointed out that the industry has not failed in a single instance to supply essential products to the military forces of the United Nations and that civilians have not been unduly inconvenienced.

Fuel-Oil Consumption For Producing Electricity Gains

WASHINGTON, D. C.—The Federal Power Commission last week issued a report entitled "Consumption of Fuel for Production of Electric Energy, 1941," showing that fuel consumed in electric-generating plants during 1941 amounted to 20,247,931 bbl. of oil, an increase of 20.7 per cent over 1940; and 205,155,517,000 cu. ft. of gas, up 12 per cent from the previous year. Coal consumption increased 21.3 per cent.

The energy generated by use of oil during the year totaled 7,563,089,000 kw.-hr. or 1,265,282,000 kw.-hr. more than during 1940. The energy generated by consumption of gas totaled 12,155,860,000 kw.-hr. or an increase of 1,073,746,000 kw.-hr. over 1940.

Administration of Connelly Hot-Oil Law Reorganized

WASHINGTON, D. C.—A reorganization of the administration of the Connally hot-oil law has been made by Interior Secretary Ickes. The Federal Tender Board at Kilgore, Tex., has been abolished and in its place the Federal Petroleum Board has been created, with branch offices at Houston, Corpus Christi, and Midland, Tex., New Orleans, La., and Wichita, Kans.

No more "federal tenders" are required for shipment of oil in interstate commerce. But the Petroleum Conservation Division of the Interior Department is maintaining a direct check on production and trans-state-line shipments through OPC offices and other branches of the department in all producing regions.

Jack Steele, former chairman of the Federal Tender Board, is now acting director of the Petroleum Conservation Division, and Ray W. Stull is in charge of the Washington office.

DEATHS

H. R. (HAL) GRUBER, 64, died Monday at his home in Chanute, Kans. A native of Clarion, Pa., Mr. Gruber had lived in Tulsa 31 years prior to last January when he moved to Chanute. He was vice president and general sales manager of Union Wire Rope Corp., of Kansas City, Mo., until his retirement. He was also a director in the company for many years. He had formerly been with Oil Well Supply Co. in West Virginia, and came to Oklahoma with Muskogee Tool Co. At one time he was chairman of the Old-Timers' Committee of the International Petroleum Exposition. A daughter survives.

THOMAS CRAWFORD, 73, Woodfield, Ohio, died recently at his home. A driller for 30 years, Mr. Crawford was well known in his region. His son, Harry Crawford, is an oil-field worker in Mount Pleasant, Mich.

JOHN MORRISON, president, Mono Oil Co., Albion, Ill., died at his home in Bloomington, Ill., October 27, following an illness of 2 years. He formerly was president of Morrison-Connor Co., Kansas City, Mo., and for 12 years was chief engineer with Wood Brothers, also of Kansas City.

D. W. ERVIN, 70, retired employe of Magnolia Petroleum Co., died last week. Funeral services were held at Galveston, Tex. Six sons and four daughters survive.

JAMES L. BRADLEY, 65, of Cyclone, Pa., died at an Olean, N. Y., hospital, 6 days following an operation he had undergone. He had been ill 3 weeks. Mr. Bradley had been a driller in the Bradford, Pa., field. His widow, a son and a daughter survive.

JACK DIES, 68, former tax commissioner for Humble Oil & Refining Co., died October 29 at a hospital in Austin, Tex. He had suffered two strokes at his ranch home near Austin, and died a few hours later. He was a former postmaster and county judge, and had made his home in Austin since his retirement in 1940.

CHARLES HOTCHKISS NORTON, 91, who had long been associated with Norton Co., Worcester, Mass., died October 26 at his home, Sharpenhoe, Red Stone Hill, near Plainville, Conn. Mr. Norton first became associated with Norton Co. in 1900, when the then Norton Emery Wheel Co. founded the Norton Grinding Co., with Mr. Norton as chief engineer. When the firms were merged in 1919 he became chief engineer for the machine division. He has not been actively engaged in business for some years because of his advanced age. He held more than 100 patents, and had contributed numerous articles to the trade press on cylindrical grinding, and other technical subjects. He was awarded the John Scott medal for the "invention of accurate grinding devices of high power" at the commencement exercises at University of Pennsylvania in 1925.

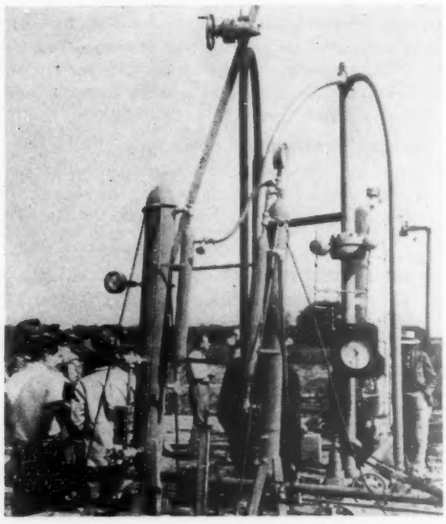
THOMAS A. WICKETT, 69, for 23 years with the traffic department of Imperial Oil, Ltd., died in Toronto, Ont., October 23.

Natural Gasoline

Natural Gasoline Association Tests Methods of Sampling Distillate

THE second of a series of four tests sponsored by the high-pressure division of the Natural Gasoline Association of America on methods of sampling distillate-well gases was held last week. The well tested was Lockhart Petroleum Corp. 1 Luling Foundation near Robstown, Nueces County, Texas. This well was chosen because of its intermediate distillate content of approximately 1½ gal. per 1,000 cu. ft.

The first test was on Chicago Corp. 9 Wardner, in the La Gloria field, Nueces County, Texas, whose distillate content is about one-half that of the Luling Foundation well. Next to be tested



View showing surface equipment for testing at the well, both by mobile testing laboratories and full-scale separator. In the foreground is a piece of experimental equipment.

will be a well having a distillate content of about 3 gal. per 1,000 cu. ft., while the final test will be made on a dually completed well.

The purpose of the tests is to determine the accuracy of sampling methods now in use on wells of different gasoline content and working pressures. Sampling tips of various sizes were used under different pressures and flowing conditions. Also, a new experimental apparatus for determining the specific gravity of two-phase gases developed by H. L. Oder, Cities Service Oil Co., and D. A. Spillers, Lone Star Gas Co., was put in operation.

The tests were under the general supervision of C. R. Williams, general superintendent, the Chicago Corp., and also N.G.A.A. vice president in charge of the high-pressure division. Directly supervising the tests were W. L. Bowser, Atlantic Refining Co., Dallas, Tex.; Mr. Sillers; J. C. Birdsall, Lockhart Petroleum Corp., Robstown, Tex.; T. A. Mathews, Phillips Petroleum Co., Bartlesville, Okla.; and William F. Lowe, secretary-treasurer, N.G.A.A., Tulsa.

Participating in the tests were Jarrett Laboratories, Alice; Henderson Laboratories, San Antonio; and Gas Laboratories and E. W. Saybolt & Co., both of Houston, Tex.

The test series started by the association last year has been slowed down by the war and by the shortage of manpower. Each test takes 5 days and is followed by a complete study of the data by the subcommittee. Owing to the complexity of the problem, it is expected that it will be some time before a report can be made on the Robstown tests. Results of the La Gloria tests were published in the proceedings of the annual convention of the association last May.

Natural Gas

Work Continued on Helium Plants Pending WPB Ruling

WASHINGTON, D. C.—Construction of expanded facilities at the Bureau of Mines' helium plant at Amarillo, Tex., are continuing, and will proceed at least until the Interior Department and War Production Board come to some agreement as to exceptions to be made to WPB's sweeping order of last week halting virtually all construction projects under supervision of several government agencies.

WPB's order was drafted without consultation with the affected agencies, it was said, and Interior Secretary Ickes said that, under a strict interpretation of the order, work would be halted at the Amarillo plant, as well as new helium installations being constructed in Colorado, Kansas, Utah and New Mexico.

However, because of the importance of these projects to the war, Secretary Ickes did not shut them down. Instead he wrote to Army and Navy authorities, advising them of the order, and wrote also to WPB, asking that the order be not literally interpreted.

Status of the order, as it affects the helium, and other plants in the Interior Department's program, now is that WPB has agreed to permit work to go ahead on the projects, and that it will look over a list of "essential" and "nonessential" construction jobs to be submitted by the department, before taking any action to close down the jobs.

Expansion of the Amarillo plant, and construction of the other four, is being carried on under five separate appropriations totaling $16,775,000.

WPB Urges Conservation of Natural Gas to Avert Shortage

WASHINGTON, D. C.—The War Production Board last week urged consumers to economize in the use of natural gas in order to avert threatened shortages.

Herbert S. Marks, acting chief of the WPB Power Branch, said that because of mounting demands of war industries and the migration of workers to industrial areas, coupled with the inability of gas companies to obtain steel and other critical materials to expand present capacity, many companies already are operating on dangerously low reserves.

"That reduced margin could easily be wiped out during periods of extreme cold weather, unless the public conserves natural gas," Mr. Marks said.

Gas conservation is necessary, he added, not only to prevent shortages but to save critical fuels. Substantial quantities of both oil and coal are used in making manufactured gas, involving extensive use of the country's transportation facilities.

Foreseeing the situation that has since developed, WPB last February issued an order (L-31) to curtail the consumption of natural gas. The order prohibited new gas-heating installations in critical areas and provided for steps to be taken to curtail gas consumption in time of shortages.

J. M. Huber Corp. to Build New Furnace-Black Plant at Borger

BORGER, Tex.—Construction will start early next month on a new carbon-black plant 3 miles west of Borger for the J. M. Huber Corp., it was announced here by company officials. Decision to build the plant, which will be capable of producing 6 million pounds of furnace black annually, was predicated on the additional requirements in conjunction with the synthetic-rubber program and at the behest of government agencies.

Addition of the furnace-black plant is another indication of the trend in the utilization of abrasive-resistant materials in tires manufactured from synthetic rubber. Experiments show that furnace black, softer in comparison with the channel black required in processing prewar natural-rubber casings, tends to minimize the generation of heat in highway operation which is one of the chief enemies of synthetic tires. Manufacturers of carbon black anticipate that stocks by the end of 1943 will be approximately 300,000,000 lb. The accumulation is made possible by current consumption at approximately 60 per cent of the prewar rate.

Before natural-rubber supplies were hemmed in by Japanese conquest of the Netherlands East Indies, furnace black was used almost exclusively in the manufacture of mechanical rubber goods. The material now is used in preparation of synthetic rubber for tire carcasses as well as tread stock and may be used in the manufacture of inner tubes.

Recycling News

Texas Co. Receives Permit For New Louisiana Plant

NEW ORLEANS, La.—The Louisiana Department of Conservation has issued an order authorizing construction of a $3,000,000 recycling plant in the Erath field by the Texas Co.

Construction work is scheduled to start immediately and the tentative completion is set for next summer.

The plant will operate on a cooperative basis, drawing gas from several properties in the field. It will be under the exclusive management of the Texas Co.

Recovery of critical petroleum products in the operation has enabled the Texas Co. to obtain a high priority rating on the project.

ENGINEERING *and Operating* SECTION

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New Problems Faced in Killing Off-Shore Cratered Blowout

By NEIL WILLIAMS

The proficiency of directional drilling as applied to relief wells for cratered blowouts again was demonstrated in the killing by Humble Oil & Refining Co. of its 6-D State in Laguna Madre, East Flour Bluff field, Nueces County, South Texas. The relief well was one of the deepest ever drilled and the pressures to be controlled were among the highest ever combated in such a project. Location of the well was 1,000 yd. offshore, where provision of adequate pumping facilities for killing the well presented problems.

SO many different applications have been found for controlled directional drilling that its practice has become an essential phase of modern oil operations. Originated as an undertaking to be followed as a last resort in certain emergencies, the practice now is being utilized more or less routinely to perform various functions in normal oil development. However, due to the spectacular circumstances involved, its employment in the killing of cratered blowout wells continues most widely known.

It is in the killing of a cratered blowout well that the proficiency of directional control of drilling is demonstrated most impressively. Here, a relief well is drilled from a convenient, safe surface location to a precalculated position in close proximity to the bottom of the blowout well, and by pumping fluid and mud through it into the producing formation around the bottom of the well the flow and pressure are readily choked. The many wells that have been killed in this way attest to the success of the procedure.

Most of these wells have been on the Gulf Coast of Texas and Louisiana. High gas pressures encountered in development in this district have led to a long succession of blowouts, while the loose, unconsolidated surface formations, typical of the area, have been conducive to cratering when wells have got out of control. Despite every known precaution and safeguard, the best of operators have been unable to prevent occasional blowouts.

Once a blowout well craters, unless some casing remains above the surface, there is little that can be done to kill the flow except to drill a directional relief well to the producing formation. Seldom, however, does the casing remain intact with a cratered hole, and unless the casing happened to be the flow string and well cemented, it would serve no useful purpose. Prior to the advent of controlled directional drilling it usually was possible only to wait in hopes that the well would bridge itself.

The first instance in which a blowout was killed by drilling of a directional relief well was in the case of the much-publicized Harrison & Abercrombie crater producer in the Conroe field, Montgomery County, Texas. This well, a completed producer in the main 5,100-ft. sand of the field, cratered when high-pressure gas from shallow sands channeled to the surface around the outside of the surface pipe. Surface connections and pipe broken off, the well flowed unrestrained from the crater from 6,000 to 12,000 bbl. of oil daily for a period of 7 months before being killed early in 1934.

Drilling of the relief well for this cratered pro-

Auxiliary mud-mixing station on shore. Heavy mud was pumped through a 5½-in. line to relief well

ducer was a joint undertaking of operators in the field. H. John Eastman, at that time a whipstocking specialist in California, and his engineers were brought to Conroe to supervise the project. It was this job that gave first important recognition to directional drilling and its possibilities in various phases of oil operation.

One of the latest and most interesting relief-well projects has been that involving the killing by Humble Oil & Refining Co. of its 6-D State, East Flour Bluff field, in Laguna Madre (Corpus Christi Bay), Nueces County, South Texas. Not only were a number of special problems and unusual circumstances faced in the killing of the well but several new engineering practices were performed.

Location of this well, in Laguna Madre, was 1,000 yd. offshore where working-space limitations created added difficulties in installation of adequate facilities for drilling the relief well and controlling the high pressures to be combated. Also, being in open water, the danger of pollution and spreading of burning oil and waste over the water required special precautions and safeguards to insure isolation of the flow from the crater.

Abnormal Pressures Encountered

At a depth of 8,570 ft., the well was one of the deepest to which there ever had been occasion to drill a directional relief well. Bottom-hole pressure, was estimated to be around 5,780 lb., which was equivalent to "normal" Gulf Coast pressure at a depth of 12,280 ft. This added not only to the hazards of drilling the relief well but also to the problems of killing the flow in the blowout well, requiring the provision of an elaborate assemblage of pumping and steam-generating capacity.

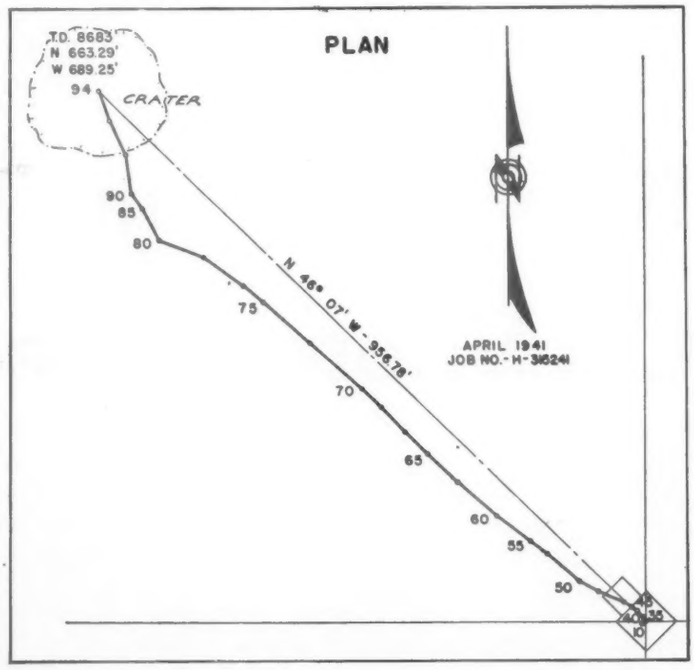
To diffuse the column of salt water which spouted from the blowout well so that it would drain harmlessly into the bay instead of spray high in the air, large, heavy pieces of junk material of all descriptions were piled on the well. A specially rigged dragline on a barge was employed for this job. The junk included approximately 210 tons of heavy iron pieces, among which was a small steam locomotive, and 167 tons of concrete slabs. This not only curbed the upward spray of water, but caused the fire to hover close to the well. Later, as the well cratered, all the junk dropped below the surface of the bay and disappeared.

Quick steps were taken to throw up a levee to isolate the well and prevent burning oil and waste from spreading and polluting the bay. The levee, several feet high above the water level and extending around the well in a circle about 350 to 400 ft. in diameter, was thrown up with a drag-line excavating shovel operated from a barge. A floating gate, constructed of old oil drums welded together end to end, was installed in one side to permit equalization of the fluid level within the levee.

Relief Well Started Quickly

Preparations were started immediately for drilling a directional relief well, a location was made in 3 days and the well was spudded in within 15 days after the first well went out of control. Location of the relief well (7-D State) was 1,000 ft. southeast of the burning 6-D State, which distance was sufficient to give protection from the hazards of the burning well and yet close enough for effective deviation operations.

In calculating the objective of the relief well it was known from slope tests that the bottom of the crater well was within a radius of 126 ft. of its projected vertical hole. The direction of the deviation from vertical was not known, but in drilling the well every effort had been made to maintain the hole as nearly straight as possible, and frequent check had been made of the amount of the deviation. Consequently, if the bottom of the relief well was placed within this radius of the proejcted vertical it could not be more than 252 ft. from the actual bottom of the crater well. The latter would be the case only if the bottoms of the two wells were on a periphery of the circle described by the 126-ft. radius at points opposite each other on a line through the center. The chances were that the bottoms would be much closer.



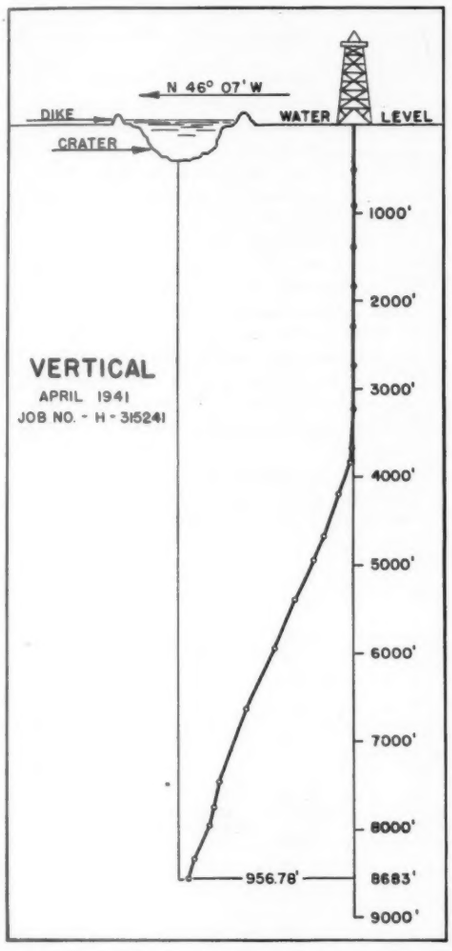
Right: Horizontal course of relief well drilled to kill cratered blowout in Laguna Madre. (Drawing by Eastman Oil Well Survey Co.)

Below: Airplane view of relief well during pumping operation, showing the blowout well at the top. The huge sand bank around the circular levee, which marks the outlines of the crater, was built up by sand blown from the well

Deviation Started at 3,705 Ft.

Final calculations upon completion of the relief well indicated its bottom was approximately 44 ft. from the projected vertical of the crater well. At this point the maximum distance it could be from the actual bottom of the crater well was 170 ft. (126 ft. plus 44 ft.), but it could have been bottomed immediately adjacent to the bottom of the blowout well. Measured total depth of the relief well was 8,683 ft., at a point 944.65 ft. north 45° 05' west from the surface location. At that point the vertical depth was 8,586.90 ft. as compared with the depth of 8,570 ft. of the crater well.

Directional work was done by Eastman Oil Well Survey Co., engineers of which company went on the job after surface casing had been cemented. The hole was drilled to 3,705 ft. before deflection was undertaken. At that depth a multiple-shot survey of the hole was made which showed the bottom to be 1° N 49° W from the surface location. An additional 9 ft. was drilled to 3,714 ft. where the first whipstock was set. With this setting the angle of drift of the hole was boosted from 1° 5' at that depth to 2° 40' at 3,746 ft. By controlled drilling and a succession of whipstock settings, the deflection then was increased steadily to the desired angle. Maximum angle attained in



Vertical course of the relief well drilled to kill cratered blowout in Laguna Madre. (Drawing by Eastman Oil Well Survey Co.)

the hole was 14° 45′ at 6,697 ft. At no time after the angle was built up did the deflection drop below 7°. The angle at the completion of the hole was 8° 30′.

While drilling from a whipstock setting at 4,052 ft. to 4,144 ft. the angle started building up too rapidly, increasing from 11° 15′ at the former depth to 13° 10′ at 4,072 ft. This was corrected, however, by backing up to the latter depth and starting a new hole. The old hole was sidetracked by going in with 85 ft. of 9⅝-in. drill collar on the bit and drilling out the underside.

Stuck Drill Pipe Sidetracked

Another sidetracking operation was accomplished at 4,482 ft. On this occasion the hole had been drilled to 5,024 ft., where drill pipe stuck. The pipe was backed off and recovered down to approximately 4,500 ft., and then by going in with 78 ft. of 8-in. drill collar on the bit, the hole was drilled out on the underside just above the top of the fish. This section of the old hole previously had given trouble, and in it were several tight places. While drilling at 4,902 ft., drill pipe had twisted off. The fish in this case, however, was recovered, and the hole had been deepened to 5,024 ft. when the pipe stuck again.

In the drilling of the well, the 13⅜-in. surface casing was set and cemented at 3,319 ft. This string was cemented to the top to insure maximum protection. Below this casing 9⅞-in. hole was drilled to 7,197 ft., where an intermediate protection string of 9⅝-in. casing was cemented. There the hole was reduced to 8⅝-in. and carried to 8,497 ft. near the top of the high-pressure gas section, where 7-in. casing was set and cemented. The remainder of the hole below the 7-in. casing into the gas sand was drilled with 6⅛-in. bit.

Nineteen whipstocks were run in the hole. These included two that were run in a short section of hole that later had to be redrilled. Deviation and directional surveys were made at 54 different points. Total elapsed time from spudding in to bottom was 2,880 hours A summary of the time required for drilling from the bottom of the surface casing to the total depth follows:

Operation—	Total time (hours)	Per cent of total time
Drilling	805	39.6
Reaming	242	11.8
Whipstocking	72	3.5
Multiple-shot surveying	31	1.5
Single-shot surveying	57	2.8
Circulating and conditioning mud	70	3.4
Fishing	111	5.4
Trips	459	22.5
Shut down	188	9.2
Total	2,035	100.0

Pumping Capacity Augmented

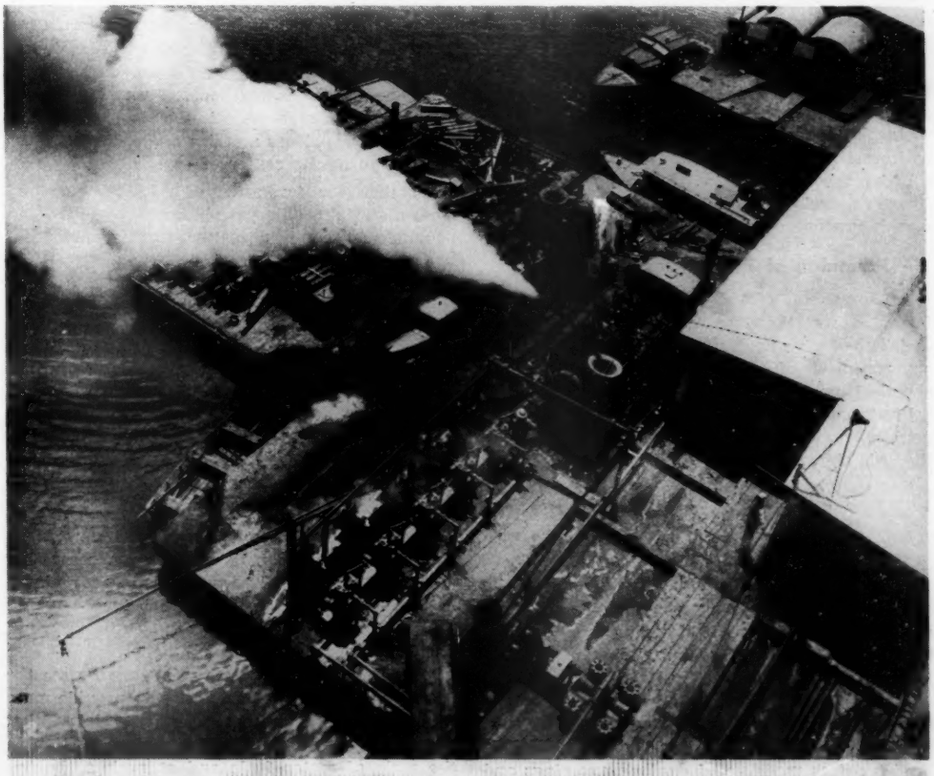
To handle the large volumes of mud and water that had to be circulated into the formation to kill the crater well, the regular pumping capacity on the rig had to be augmented greatly. While drilling, the rig had one 20-in. and two 18-in. mud pumps, one of the latter two being used for mixing and general service, and as a standby for the others. These pumps, along with mud storage and other mud-handling facilities, occupied a barge tied up at the location during the operations. Additional pumps provided included another 18-in. mud pump, two Halliburton pumping trucks, and a battery of five 6-in. boiler-feed pumps. The supplemental pumps were mounted on a separate barge, which was tied up alongside the regular mud-pump barge, and connected into the system. The additional 18-in. pump and the two trucks were available to assist the regular pumps in circulating the heavy mud and building up pressure. The five 6-in. pumps were used exclusively for water circulation. Suction for water circulation, both by the trucks and the 6-in. pumps, was taken directly from the bay.

Three additional 130-hp., 300-lb. working pressure boilers, making a total of six at the well, were provided to take care of the increased steam requirements. These were set up on a separate barge, which was secured at the side of the regular boiler barge.

Auxiliary Mud Station on Shore

An auxiliary mud-mixing station was located on shore. Stationed there were five Halliburton trucks, two for handling water and three for mixing mud, and one 20-in. and two 18-in. mud pumps for pumping the mud from the station to the relief well. Connecting the station with the rig were a 5½-in. mud line and a 2½-in. mud return line. Four 130-hp., 300-lb. working pressure boilers supplied the necessary steam. To insure an adequate supply of fresh water, a large reservoir was provided and filled. Service lines to the pumping trucks were laid underground to clear working space of obstructions. Fifty carloads of weighting material were stacked at convenient places, and during the mixing operations 275 men were kept busy handling the sacks to the various hoppers.

Preparatory to pumping, a packer was set in the relief well at 8,537 ft. to seal the annular space behind the 4-in. pumping string of pipe above the producing formation. The well was equipped with three blowout preventers, and in addition a high-pressure pumping manifold, having three discharge lines to the well, was installed. Injection was started with bay water pumped at a pressure of 4,500 lb. Breaking the formation, pressure was dropped to 2,300 lb. and pumping



Supplemental high-pressure pumping facilities provided at rig of relief well to assist regular rig pumps in circulating water and heavy mud to the producing horizon. Pumps were installed on barges

of water then was started at the rate of 175 bbl. per hour at 3,000-lb. pressure to wash the channels through the formation between the wells so that heavy mud could be circulated later. Within 4 hours a chemical tracer, which was pumped with the water, showed up in the crater well proving that contact had been made between the wells.

Water Circulated 9 Days

Water was circulated for 9 days at an average rate of about 155 bbl. per hour at a pressure of 2,300 lb., in which time the volume of gas blowing declined an estimated 96 per cent. Pumping of 17-lb. mud then was started to build up a column of mud in the blowout well of sufficient weight to equalize the bottom-hole pressure.

Although the crater continued to bubble and show a little gas for some time afterwards, the rig on the relief well was moved off, and for all practical purposes the blowout was killed, and the well is now dead. The gas which continued to show was believed to have come from one of the upper sands somewhere around the bottom of the surface casing.

During the mud-pumping operations, several barrels of mud containing carnotite, a radioactive material, were added. Later a radioactive log was made of the relief well to determine the position of the material, if any of it found its way up behind the casing. No indication was given that any of it had channeled behind the casing so it was assumed that all the mud pumped into the hole had gone out into the formation.

Remaining at the scene of the blowout is a large sand bank which was built up around the outside of the levee surrounding the crater location while the well was blowing. The enormous amount of sand is indicated by the fact that although the depth of the bay at that point had been from 6 to 9 ft., the sand bank now is well above the surface of the water.

Care and Use of Rubber Gloves and Footwear

A series of instructions has been issued by H. M. Nichols, manager of Atlantic Refining Co. regarding the use and care of certain critical war materials in use in the company's plants. Since all refiners are interested in accomplishing the same end, these items will be published serially in coming issues. Mr. Nichols explains:

"The following is sent to each department superintendent with enough copies for each foreman and bulletin board. The items are discussed at a meeting of the foremen and superintendent, after which the men are individually instructed. Since the foreman must sign an order to get the proper clothing and since the tool room checks this order when the goods are returned a definite control exists.

"Through inspections, causes for trouble are eliminated, and these incidents are brought to the attention of the men. The results in saving this vital material, rubber, have justified the time spent."

At present we use three kinds of rubber gloves: All rubber, long-gauntlet gloves; rubber-covered canvas, short-gauntlet gloves, and neoprene, or synthetic-rubber, long-gauntlet gloves. The all-rubber gloves are used for protection against acids and caustics. The rubber-coated canvas gloves are used in places where occasional protection against oils and solvents is needed and the all-neoprene gloves are used where continuous protection against oils and solvents is needed. The all-neoprene gloves are the only ones that will withstand oil.

All these gloves can be obtained at the tool house for daily use by the man presenting his tool check and signing an order. They can also be obtained on permanent holdout by presenting a tool order approved by the department superintendent and a foreman's order with a charge signed by the foreman on the job.

From the standpoint of footwear, our stock consists of rubber hip boots, rubber arctics, and rubber shoes. All these are equipped with steel toe guards. This footwear can be obtained from the tool house in the same manner as the gloves.

All wearing apparel issued for permanent holdout is new material purchased from the storeroom tool department. The wearing apparel issued by the tool house for daily use is not always new but it is always sterilized before being issued.

Below are listed a few precautions to be observed in regard to the above-mentioned wearing apparel:

Get the proper type of equipment for the job you are doing. Don't use rubber wearing apparel in contact with oil.

Hang hip boots up in your locker. If thrown into the locker, they will crease and finally crack, destroying them.

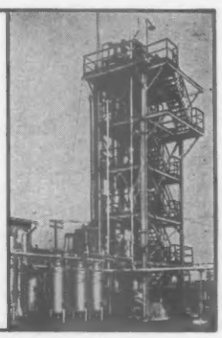
If you are wearing boots, arctics, or rubber shoes, don't try to force a shovel into hard ground, because it will cut the sole.

Protecting Lighting Wires

To prevent vibration of a rig from chaffing and short-circuiting lighting wires, a Texas drilling contractor protects the wiring at points of contact with short lengths of old air or steam hose, through which the wire is run. The hose guards, split longitudinally for insertion of the wire cable, are fastened to the derrick and rig at points of wire contact. They may be slipped along the wire to any position desired.

CHEMICALS *from* PETROLEUM

By W. T. ZIEGENHAIN



NAPHTHENE-NAPHTHALENE

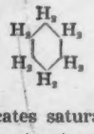
LAY readers of petroleum chemistry may easily be confused by the similarity of the spelling of two terms, namely, naphthene and naphthalene. Further confusion can develop if the individual associates the ending "ene" to denote a double bond between two carbon atoms or what is generally called "unsaturation."

The use of such an ending is, of course, generally indicative of this but the rule cannot be applied to a naphthene. By definition, a naphthene is any one of a series of saturated cyclic hydrocarbons of the general formula $C_n H_{2n}$. Such a hydrocarbon might also be called a cyclo-paraffin or a cyclo-alkane, depending upon the nomenclature one chooses to follow.

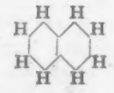
Formulas of Two Types Compared

A comparison of the chemical and structural formulas for the two types of materials for which these two names stand will tend to clarify any confusion of general properties, based upon chemical generalizations.

First, naphthene is a family of materials while naphthalene is a single chemical. A typical naphthene is shown as



This clearly indicates saturation among all the carbon atoms. The structure includes a single ring of carbon atoms. This arrangement is comparable to that of a saturated aliphatic hydrocarbon that has lost a hydrogen atom at each end of the chain and has thereby caused the ends to join to form a single ring. In contrast with this, naphthalene represents but a single material. It is pictured as made up of two benzene rings and is decidedly unsaturated. Its structural formula can be shown as



Here the high degree of saturation becomes apparent. Chemists have explained the structural formula of naphthalene as comparable to bringing two benzene rings together. It makes little difference to them whether one views the rings as having alternate double bonds between the carbons or considers a series of double bonds as neutralized at the center of each ring.

Whether the formation of a ring compound from a straight-chain petroleum hydrocarbon can be made as simple a matter as this partial dehydrogenation on a large scale is a moot question but chemists do agree that cyclization of straight-chain petroleum hydrocarbons is possible. Some go so far as to account for ring compounds in petroleum as due to the direct condensation of olefins and their subsequent decomposition into naphthenes. This has been verified in the laboratory and plant to a limited extent by the use of aluminum chloride as a reactive medium for bringing the olefins together.

An example of cyclization which has reached practical application is the conversion of butenes into a mixture of naphthenes by its use. The process is patented and provides for contacting 56 times as much hydrocarbons as aluminum chloride and at a temperature below —10° C. After 2 hours, about 90 per cent of the propenes had been converted into naphthenes.

It might be of interest to refiners, who see the growing application of chemistry to provide more desirable antiknock motor fuels, to learn that many ring compounds enjoy a high position in the scale of motor fuels and at such a time as cyclization is made necessary on a large scale many of the details are already known.

S S C SPECIALIZES IN THE ACCURATE REVEALING OF GEOLOGIC STRUCTURE

Superficial folds in the Lance formation, Rosebud County, Montana.

Photo courtesy United States Geological Survey

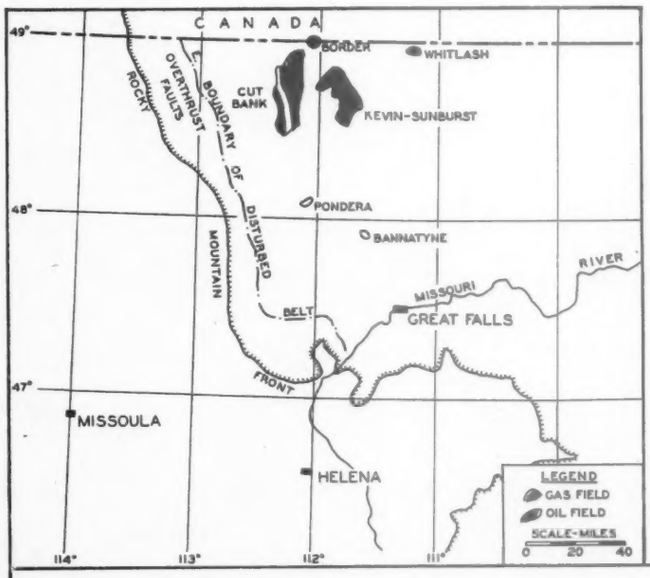
TYPICAL OIL-FIELD STRUCTURES

Sedimentation Trap

Cut Bank, Montana

(Compiled by The Oil and Gas Journal)

GENERAL GEOLOGY: Throughout northern Montana the Madison limestone of Mississippian age is the lowest formation of which we have any knowledge at the present time. During the Triassic or early Jurassic, the region was elevated, involving the Sweetgrass arch and the area to the northeast. Triassic and Permian deposits may not have accumulated in the area, but if they did they were eroded together with Pennsylvanian, upper Mississippian and part of the lower Mississippian (Madison). The sea then advanced to deposit the Ellis formation (Upper Jurassic), and retreated when the area west of the present Rocky Mountain front was elevated. During the Lower Cretaceous and when these mountains were being eroded, the Kootenay formation was deposited. There followed renewed uplift and deposition of the Blairmore formation and, accompanied by additional oscillations, other Upper Cretaceous formations. At the close of the Cretaceous there was repeated folding and warping of the Sweetgrass arch.



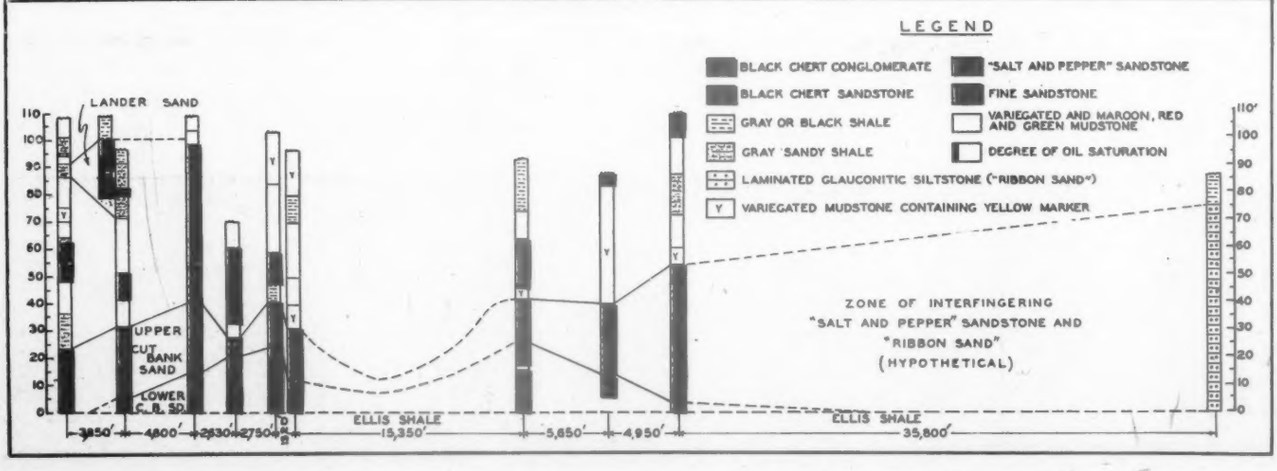
STRUCTURE: The major structural feature in the Cut Bank district is the Sweetgrass arch to the east. At Cut Bank, the regional dip is from 70-75 feet to the mile and there is no local structure except for minor topographical irregularities on the top of the Ellis formation on which the Cut Bank sand was deposited, combined with some minor wrinkling which is important in the localization of the gas but seems not to have affected oil accumulation.

OIL-BEARING HORIZONS: There are several pays in the lower part of the Kootenay. These are the Moulton and Sunburst zones (the latter including the locally rich Lander sand) and the upper and lower Cut Bank. Of these all but the Lander and the lower Cut Bank are predominantly gas pays. The Lander sand produces in a small pool in which the sand lies below the oil-water contact in the Cut Bank sand. It is on a small nose that accumulation here may be governed by structure. Recently another Lander sand pool has been opened. The Cut Bank is divided into two zones on lithologic grounds and grades updip into a laminated glauconitic siltstone with which it is believed to be contemporaneous and which is found in the Kevin-Sunburst field to the east. The occurrence of gas updip is, therefore, regulated by gradation into an impervious rock which was originally deposited in deeper water.

ORIGIN OF THE OIL AND GAS: The impervious nature of the siltstone to the east indicates that the oil was not formed on the sea floor beyond the area occupied by the Cut Bank sand. Nor is it likely that it originated to the west, as this was the landward side at the time of deposition of the reservoir sands. A local origin with source material deposited in the producing sands is therefore indicated.

OTHER FIELDS OF THE SAME TYPE: As sands generally grade laterally into finer and more impervious sediments, this relation at Cut Bank is repeated in most sand fields with one important exception. Normally, the fine-grained

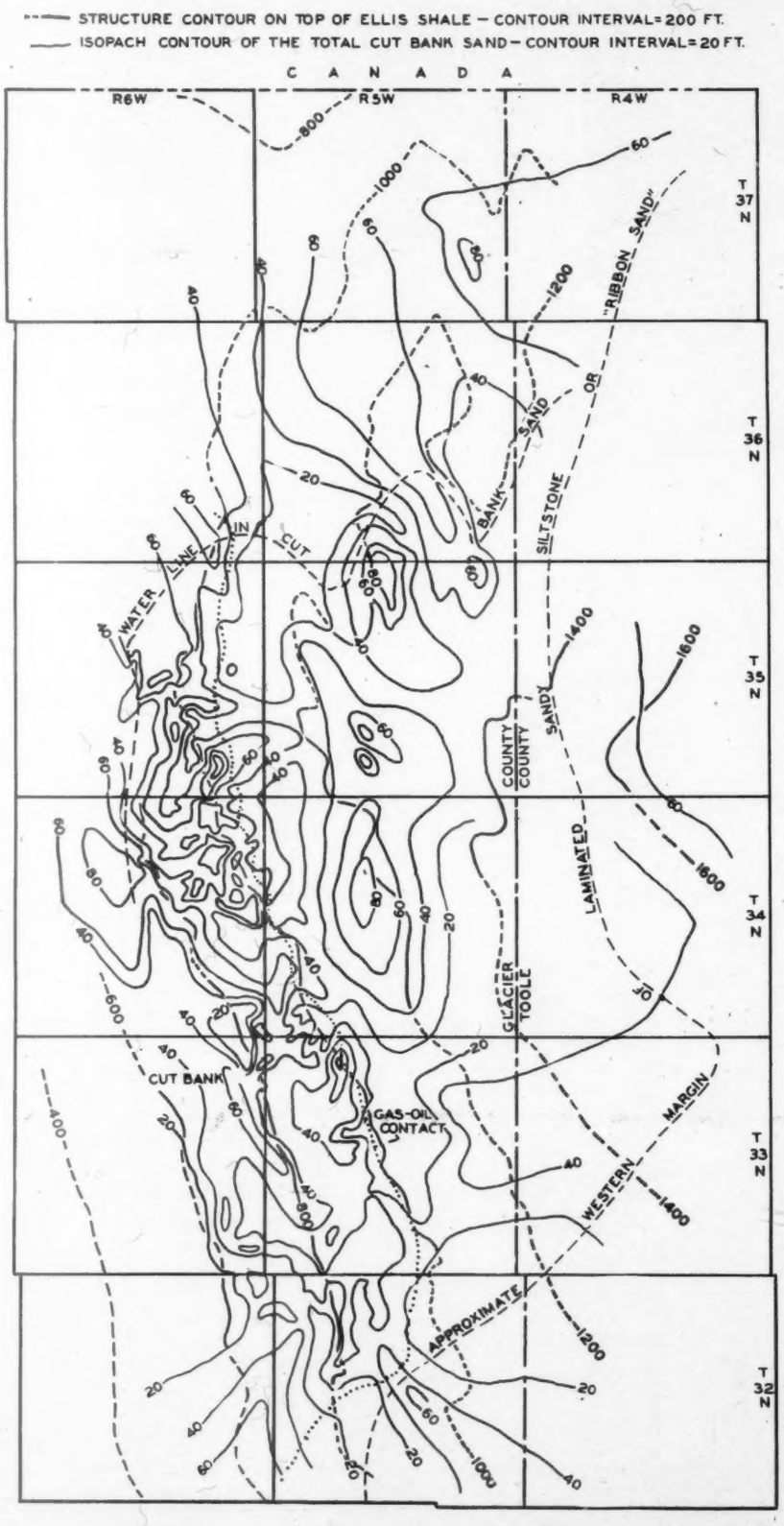
Above: Oil-field map of northern Montana. Below: Cross-section showing sand conditions and illustrating stratigraphic trap. Drawn without regard for structure, datum top of Ellis shale

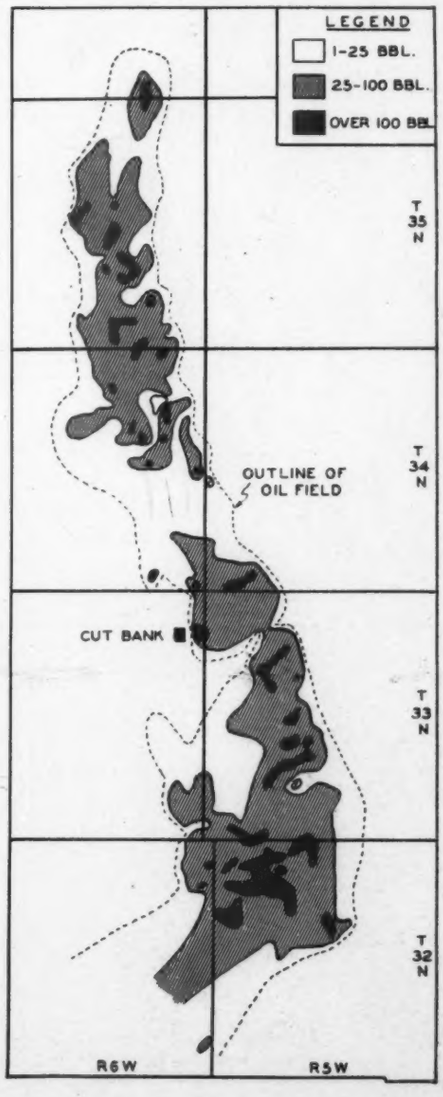


impervious material lies downstructure and below the water level so that few wells penetrate it. Cut Bank, however, has had its dips reversed by uplift of the Sweetgrass arch so that the water is found at the pinched-out shoreward wedge-edge with the gas updip where the bed has attained its maximum thickness. This condition is theoretically limited to occurrences on the flanks of highs which lie in front of a more prominent uplift. They may be expected along the Red River belt of folding in Texas, on structural trends in the Appalachian area and in similar positions. The Burbank and other Pennsylvanian fields in eastern Oklahoma and Kansas are in an area where present dips are in the opposite direction to original depositional dips.

EXPLORATION METHODS: The discovery of fields of this type, unless by random drilling, is conducted with considerable difficulty. Cut Bank was found by an operator who sought an extension to Kevin-Sunburst and the gas sand found was considered a stray similar to those found above the latter field.

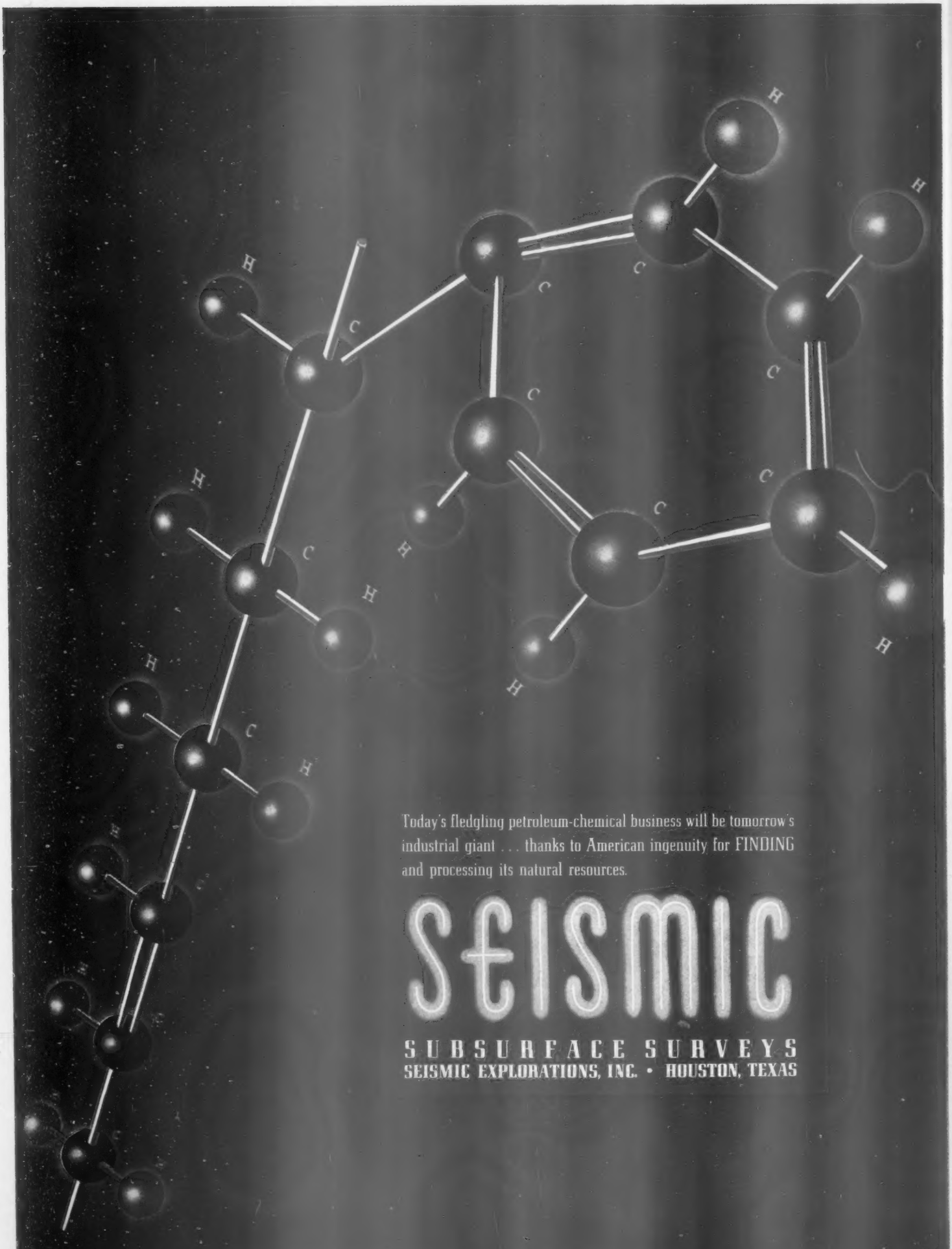
Wedge edges may be found by subsurface convergence studies, either by geology or by seismograph. The possibility of a reversal of the original dip may be postulated by regional studies in which the time of movement of the uplifts and their relative importance can be ascertained. The presence of water in a formation converging downdip might lead to exploratory drilling updip with favorable results.





Left: Map showing structure of Cut Bank oil and gas field (red) and thickness of Cut Bank sand section (blue). Right: Map of Cut Bank oil field, showing variation of initial production of wells in Cut Bank sand

Principal reference: John E. Blixt, Cut Bank Oil and Gas Field, Glacier County, Montana. Stratigraphic-Type Oil Fields, pp. 327-381


Today's fledgling petroleum-chemical business will be tomorrow's industrial giant . . . thanks to American ingenuity for FINDING and processing its natural resources.
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Operating Ideas

Tong Made From Timing Chain

A tong for rolling pipe being run through a straightening machine was made by an Illinois operator by the use of a piece of silent timing chain from an automobile. The tool has a leverage handle with a forked end through holes in which the chain is run. Application of pressure tightens chain, which grips the pipe.

Stove From Old Gas-Engine Piston

A 20-in. piston from an old gas engine has been converted by an Oklahoma oil-field machine shop into an effective heating unit for use in the shop. It was only necessary to close the wrist-pin holes and install a burner and feed-line connection in the bottom. The unit has saved the purchase of a new stove.

Handy Rack Holds Switcher's Tools Above Floor Level

A handy rack for keeping such tools as a shovel, hoe, rake, scraper, broom, etc., in place away from under foot was devised by a switcher on an Illinois lease. It has a base, consisting of a piece of plate metal in which appropriate grooves or notches are cut to hold the respective tools. Handles are held in position in a hook-shaped arm fastened to a back board constructed of plywood. Also on the backboard at one side is a special holder for an oil can. The rack is raised a few inches above the floor by means of legs constructed of rod material. It can be moved easily where desired.

Portable Air Tank Keeps Tire Pressure Up

By means of portable compressed-air tanks the regular "airing up" of tires in United Gas Pipe Line Co.'s garages is accomplished with ease and efficiency without moving of cars or trucks. The original unit, devised in the Monroe, La., district garage, was built from a short section of 14-in. pipe, using ½-in. boiler plate, welded on, to seal the ends. A 1-in. stay rod was welded inside. It was mounted horizontally on rubber-tired wheels made from valve seats of an oil-well mud pump. A tongue from a child's small wagon was attached to pull it. Since, similar units, such as the one shown in the picture have been built for other company garages. The tank has sufficient capacity because of its size and strength to store air sufficient to inflate many tires without needing to be recharged. (Photo, courtesy United Gas Log.)

QUESTIONS ON TECHNOLOGY

By W. L. NELSON, Technical Editor

Propane Replacing Butane In Bottle Gases

With butane being used so much for rubber, what is to happen to users of bottle gas?—J. R. P.

Although the butane gases are fundamentally the stocks from which some rubber and part of our 100-octane aviation gasoline is made, to date not much butane has been withdrawn from the liquefied petroleum gas industry. Such withdrawals as have been made have been replaced to a large extent by the incorporation of propane in some liquefied petroleum products.

The use of propane introduces only one major difference in the properties of the liquid mixture, i.e., the vapor pressure increases. This necessitates the use of higher tank and piping-system pressures but not radical ones unless large amounts of propane are substituted for butane. The vapor pressures of various mixtures at 60° F. are about as follows.[1]

	Lb./sq. in. (Reid)
Nearly 100 per cent butane product	11
90 per cent butane 10 per cent propane product	21
80 per cent butane 20 per cent propane product	29.5
70 per cent butane 30 per cent propane product	37
60 per cent butane 40 per cent propane product	43

For handling at higher temperatures such as those occasionally encountered on hot days or in lines or tanks exposed to the sun, vapor pressures are much higher, being somewhat as follows:

	Lb./sq. in.
Commercial butane at 105° F.	65
Industrial propane at 105° F.	204
Commercial propane at 105° F.	206

Thus, the existing equipment should be checked as to its suitability to stand higher operating pressures. Most of the suppliers of bottled gases have a technical staff for checking such matters.

In a general way vaporization will be facilitated by the use of more propane in the bottle-gas mixture. As vaporization takes place, the material left in the tank comes nearer and nearer to the composition of butane (or heavier impurities) and hence it has been common practice in the past to purposely have some propane in the bottle gas so that the propane will carry the heavy ends out of the tank with it. The behavior of a tank of bottle gas is illustrated in the following tabulation[1] which shows how the pressure changes, how the gas composition changes, how the heating value of the gas changes and how the condensation temperature of the gas changes, as a 90-10 butane-propane mixture vaporizes out of a tank (60° F.).

CHANGE IN CHARACTERISTICS OF GAS AS CYLINDER IS EMPTIED

Per cent liquid left in tank—	Per cent propane in gas	Pressure, lb. per sq. in.	Heat value, B.t.u./cu. ft.	Condensation temp. or dew point, °F.
100	17	21	3,000	18
80	12	17	3,100	22
60	6	14	3,180	28
40	2	13	3,240	32
20	1	12	3,270	33
0	0	11	3,280	34

If the gas-control system for such a tank has been set to operate best at say 15 lb. per sq. in., it would be best to refill the tank when it is yet about 40 per cent full. In time the liquid in the tank would become enriched with butane (and heavier) materials and hence it might then be necessary to order a liquid of somewhat higher propane content of say 20 per cent propane rather than 10 per cent propane. These are all details that should be carefully checked by supply organizations, and are not to be decided by the purchaser.

In buried tanks[2] the rate of generation of gas is dependent upon the temperature of the soil and the amount of tank surface which contacts the soil. In such tanks, the addition of some propane is often advantageous. Butane vaporizes at about 35° F. (1-lb. gage pressure) whereas propane boils at about minus 40° F. Thus, a soil temperature of 50° F. (a good winter average) will cause butane to vaporize but not very rapidly, but a soil temperature of 30° F. as in some northern climates would not vaporize butane. In the latter instance, the use of additional propane would solve the difficulty and would be useful during the winter months in almost any climate.

Propane may be considered as the solution to shortages that may arise in the liquefied petroleum gas industry. Although this material is somewhat more difficult to extract from natural gas than is butane, it is more abundant and hence there is little need to worry that suitable liquefied gases of some sort will fail to continue to be available.

References

1. E. B. Evans—Batch Vaporization of Butane-Propane Mixtures, Liquefied Petroleum Gas "Jet," Vol. 1, No. 3, 1934, or Bull. No. 89 of Phillips Petroleum Co.
2. W. L. Nelson—Vaporization From Buried Butane Tank, The Oil and Gas Journal, p. 89, Feb. 27, 1941.

Gravity Versus Boiling Point Of Distillate Residue

In analyzing the distillate from a recently completed well we were interested to discover that the A.P.I. gravity of the residue boiling above 440° F. was 42.9 in spite of the fact that it contained over 15 per cent of paraffin wax. Is this not a very high gravity?—R. S. N.

With recent developments of distillate wells, synthetic gasolines or oils, and other freak oil stocks, it is becoming difficult to keep typical properties in mind. The gravity of 42.9 is high and yet not unlikely if the distillate is extremely paraffinic. The following tabulations of the molal average boiling points of 42.9 A.P.I. stocks of various types will indicate the situation:

Type of stock—	Average molal boiling point, °F.
Paraffin hydrocarbons	630-670
Paraffin-base stock	500-570
Mid-Continent stock	420-455
Gulf Coast and cracked stocks	245-360
Benzene hydrocarbons	low*

*No benzene hydrocarbons having this high a gravity.

In connection with this tabulation it should be noted that molal average boiling points are used rather than boiling points on the usual liquid volume per cent basis. For short boiling-range cuts there is little difference between results by the two bases, but for longer-range cuts the temperature at 50 per cent by liquid volume is somewhat higher than the average molal boiling point. For this reason the temperatures given in the table may be considered as minimum ones. Thus, it is evident that a paraffin or highly paraffinic residue boiling above 440° F. could have a gravity of 42.9 or even a little higher depending upon the distribution of materials in the residue.

Such a gravity appears high with respect to Mid-Continent experience, but is not out of line for Pennsylvania operations.

References to Synthetic Rubber

In connection with the insurance of rubber plants, toluene plants, etc., we need information about the processes that are involved and the hazards attendant to the operation of them. Can you direct us to suitable references on these processes?—M. A. S.

Due to the secrecy involved with regard to many plant developments, precise or even general information is not available to the reader public. For this reason it is necessary to resort to the current literature, technical magazines and abstracts of them, and to fundamental scientific books, coupled with the advice of a capable technical man who can interpret and relate such disclosures as are available.

Perhaps the best tabulation of recent current literature is the mimeograph publication (now second edition) of the technical department of the Tulsa Public Library. This lists about 347 articles or references under such topics as general, chemistry, physical properties, alcohol, ameripol, buna, butadiene, butyl, chemigum, guayule, hycar, koroseal, neoprene, thiokol, miscellaneous, petroleum industry, Standard Oil patents, Germany, Japan and Russia. The bulk of these references are quite recent but some date from 1939.

No other very direct sources are available although useful information is available in Carleton Ellis' books, "The Chemistry of Petroleum Derivations," in two volumes, and "Chemistry and Technology of Rubber" by Davis & Blake (both Reinhold Publishing Corp., New York).

Of course it is always possible to scour the technical literature by means of chemical abstracts, engineering index, reader's guides, etc., which are available in most first-class libraries.

KEEP YOUR SCRAP MOVING
. . . for the Duration

The steel mills need scrap—millions of tons of it—and the need is not temporary. For the duration of the war the need for scrap will be vital to War Production and should be kept moving to the steel mills.

And not only steel is needed—rubber, copper, brass, aluminum, lead, etc., are also needed in large quantities.

We've been a nation of "savers." We hate to throw things away, and save them for a time "when they will come in handy."

Now — let us all look over these "rainy day" junk heaps and turn in all pieces that are not needed.

You, too, can help assure victory for a better tomorrow!

TURN IN YOUR SCRAP TO WIN THE SCRAP!

REED ROLLER BIT CO.
HOUSTON, TEXAS.

Methods of Preparing Butadiene

(PART 1)

By GUSTAV EGLOFF and GEORGE HULLA
Universal Oil Products Co., Chicago, Ill.

***EDITOR'S NOTE:** The Oil and Gas Journal has arranged with the research staff of Universal Oil Products Co. to publish a complete summary of sources of butadiene as revealed by the technical literature and by the latter company's research staff. Some idea of the program can be derived from a perusal of the summary of data to be included listed on the opposite page. This material will be continued as a short series until the data provided in the 38 tables are covered.*

BUTADIENE is a key hydrocarbon in the synthetic-rubber program and from the commercial standpoint will be produced from petroleum and ethyl alcohol. Other important hydrocarbons in this program are styrene, ethene, isobutene and acetylene. The synthetic-rubber program, according to the president's special rubber committee,* calls for a yearly production rate of 886,000 tons, made up of

Synthetic rubber—	Tons
Buna-S	705,000
Butyl	132,000
Neoprene	49,000

and a recommended increased rate of 220,000 tons, or a total of 1,106,000 tons. The additional 220,000 tons are distributed as follows:

Synthetic rubber—	Tons
Buna-S	140,000
Neoprene	20,000
Thiokol	60,000

The present butadiene yearly tonnage schedule will be produced from raw materials as tabulated:

Raw materials—	Tons butadiene
Grain alcohol	242,000
Butene	283,000
Butane	66,500
Refinery (conversion processes)	20,000
Refinery conversion processes and butene combinations	93,500
Total	705,000

The committee has recommended another 100,000 tons of butadiene to be derived from refinery processes in order to provide the quantity necessary for the increased 140,000 tons of buna-S type rubber. Hence a total of 805,000 tons a year of butadiene will be required for the present program.

*Message from the president of the United States: "The Rubber Situation," report of the special committee, 77th Cong., 2d sess., H. Doc. 836, U. S. Government Printing Office, Sept. 10, 1942.

It is reported that Germany's chief source of butadiene for synthetic production is based upon acetylene. A series of chemical reactions starting with acetylene takes place as follows:

Acetylene→
acetaldehyde→aldol→buteneglycol→butadiene

Russia produces butadiene largely from ethyl alcohol through a catalytic dehydrogenation-dehydration process; it is then converted into synthetic rubber.

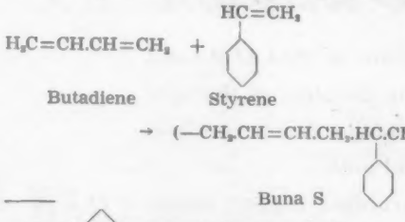
The catalytic reaction of butadiene from ethyl alcohol probably follows a similar mechanism as acetylene conversions, i.e., through the acetaldehyde stage:

Ethyl alcohol→
acetaldehyde→aldol→buteneglycol→butadiene

The accompanying diagram, which is essenially after that of Ostromyslenskii,* indicates the status of butadiene production in the World War I period. It will at once be apparent that the present war period is characterized by a greater number of reaction paths and of starting materials.

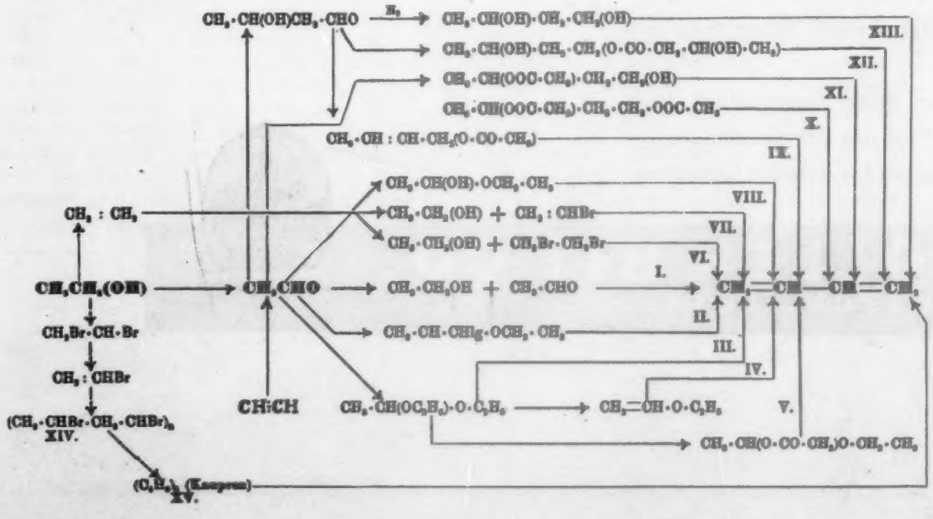
Buna-S synthetic rubber is a copolymer of butadiene and styrene; whereas butyl rubber is a resultant of isobutene and butadiene polymerization. Neoprene is derived from acetylene by conversion into vinylacetylene and addition of hydrogen chloride. Thiokol is a product from the reaction of ethene dichloride and sodium polysulfide.

Synthetic rubbers are high molecular weight compounds which are multiples of the basic substances that enter the reaction. The following are mechanisms of these reactions, the multiples being expressed as the quantity taken X times.

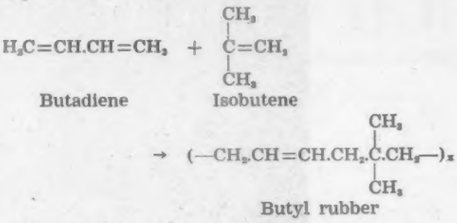


(Note: ⬡ represents benzene ring.)

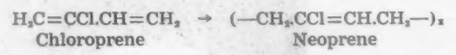
*J. Russ. Phys. Chem. Soc. 47, 1472-1194 (1915).



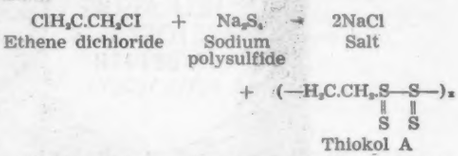
That of butadiene and isobutene is similarly depicted:



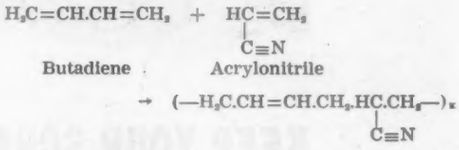
The formation of neoprene from chloroprene, which is the usual vinylacetylene and hydrogen chloride addition product, is regarded as an ordinary polymerization:



Thiokol is an alkene polysulfide formed as follows:



Besides the foregoing polymerizations of butadiene, its union with acrylonitrile may be mentioned:



The product is variously known as Buna N and Perbunan.

Butadiene—Its Commercial Production

The following are commercial processes now in use or projected:

1. *Thermal cracking of hydrocarbons:* (*a*) Propane-butane; (*b*) naphthas; (*c*) gasoline; (*d*) kerosene; (*e*) gas oil; (*f*) other fractions of crude oil.

2. *Thermal cracking of hydrocarbons (high temperature):* (*a*) Presence superheated steam; (*b*) presence flue gases; (*c*) presence mixtures superheated steam and flue gas; (*d*) partial air oxidation of naphthas and gasoline.

3. *Catalytic dehydrogenation of hydrocarbon gases:* (*a*) Butane; (*b*) butene-1 and -2; (*c*) mixtures butane and butenes.

4. *Acetylene.*

5. *Ethyl alcohol:* (*a*) Dehydrodehydration and alkenation.

6. *Buteneglycol:* (*a*) Dehydration.

It is interesting to learn that 105 years ago Bouchardat* in France discovered butadiene as a reaction product of the destructive distillation of natural rubber. As far as we know, this is the first record of butadiene formation.

In the present study of butadiene formation, 83 classes are considered, of varying value from a yield and cost standpoint. One may make the general conclusion that practically all organic compounds under some conditions will produce as a reaction product—butadiene.

Table 1 gives data on thermal reactions of al-

*Jour. de Pharmacie 23, 454-64 (1837); Ann. 27, 30-40 (1838).

SUBJECTS WHICH WILL BE COVERED IN SERIES BEGINNING ON OPPOSITE PAGE

A. Hydrocarbons

I. Thermal Treatment of Alkanes (Table 1)
- a. Methane
- b. Ethane
- c. Propane
- d. *n*-Butane
- e. 2-Methylpropane
- f. *n*-Pentane
- g. 2-Methylbutane
- h. *n*-Hexane
- i. 2-Methylpentane

II. Thermal Treatment of Alkenes (Table 2)
- a. Ethene
- b. Propene
- c. Butene-1
- d. Butene-2
- e. 2-Methylpropene
- f. Pentene-1
- g. Pentene-2
- h. 3-Methylbutene-1
- i. 2-Methylbutene-2
- j. Hexene-1
- k. 3-Methylpentene-1
- l. 4-Methylpentene-1
- m. "Dibutene"
- n. 2,4,4-Trimethylpentenes
- o. "Diamylene"
- p. *n*-Hexadecene

III. Thermal Treatment of Alkadienes (Table 3)
- a. 2-Methylbutadiene-1,3
- b. 2,3-Dimethylbutadiene

IV. Thermal Treatment of Cyclanes and Bicyclanes (Table 4)
- a. Methylcyclobutane
- b. Cyclopentane
- c. Methylcyclopentane
- d. "Dimethylcyclopentane"
- e. Cyclohexane
- f. Methylcyclohexane
- g. Ethylcyclohexane
- h. "Dimethylcyclohexanes"
- i. Allylcyclohexane
- j. Decahydronaphthalene

V. Thermal Treatment of Cyclohexenes (Table 5)
- a. Cyclohexene
- b. 1-Methylcyclohexene-1
- c. 1-Methylcyclohexene-3
- d. 1-Vinylcyclohexene-3

VI. Thermal Treatment of Benzene (Table 6)

VII. Thermal Treatment of Petroleum and Its Fractions (Table 7)
- a. Naphtha
- b. Gasoline fractions
- c. Gasoline
- d. Kerosene fractions
- e. Kerosene
- f. Solar oil
- g. Machine oil
- h. Transformer oil
- i. Heavy naphtha—light gas oil
- j. Cylinder oil
- k. Gas oil
- l. Fuel oil
- m. Mazut
- n. Paraffin wax
- o. Topped crude oil
- p. Crude oil
- q. "Petroleum"

VIII. Thermal Treatment of Natural Gas, Petroleum Distillation or Cracking Gases, Natural Rubber, and "Butadiene Rubber" (Table 8)
- a. Natural gas
- b. Petroleum distillation gas
- c. Petroleum cracking gas
- d. Natural rubber
- e. "Butadiene rubber" from cauprene bromide

IX. Catalytic Cracking (Table 9)
- a. 2-Methylbutane
- b. *n*-Butenes
- c. Cyclohexane
- d. Cyclohexene
- e. Benzine
- f. Benzine from pressure hydrogenation of brown coal
- g. Illuminating petroleum (kerosene?)
- h. Gas oil

X. Electrical Treatment (Table 10)
- a. Methane
- b. *n*-Hexane (?)
- c. *n*-Heptane (?)
- d. *n*-Octane (?)
- e. *n*-Nonane (?)
- f. *n*-Decane (?)
- g. Ethene
- h. Ethyne
- i. Ethyne containing hydrogen, or hydrogen chloride, or ethene, or ethene plus hydrogen
- j. Kerosene

XI. Isomerization (Table 11)
- a. Butadiene-1,2
- b. Butyne-1
- c. Butyne-2
- d. Methylenecyclopropane
- e. 1-Methylcyclopropene-1

XII. Hydrogenation (Table 12)
- a. Butenyne
- b. Butadiyne

XIII. Catalytic Dehydrogenation of *n*-Butane (Table 13)
- a. One stage
- b. Two stage

XIV. Catalytic Dehydrogenation of Butene-1 (Table 14)

XV. Catalytic Dehydrogenation of Butene-2 (Table 15)

XVI. Catalytic Dehydrogenation of *n*-Butenes (Table 16)

XVII. Dehydrogenation of *n*-Butane and *n*-Butenes in Presence of Chlorine and/or Hydrogen Chloride With or Without Oxygen (Table 17)
- a. *n*-Butane and chlorine
- b. *n*-Butane, chlorobutanes, and chlorine
- c. *n*-Butane, *n*-Butenes, and chlorine
- d. *n*-Butenes and chlorine
- e. *n*-Butane, hydrogen chloride, oxygen, and steam
- f. *n*-Butenes, chlorine, and hydrogen chloride
- g. *n*-Butenes and hydrogen chloride

XVIII. Partial Oxidation (Table 18)
- a. *n*-Butane
- b. Difficultly condensable alkanes
- c. Ethene
- d. Butene-2
- e. Cyclohexane
- f. Cyclohexene
- g. Benzene
- h. Toluene
- i. Naphthalene
- j. Petroleum naphtha
- k. Crude petroleum
- l. Tar oils

XIX. Ethenylation of Ethene (Table 19)
- a. Ethene *per se*
- b. Ethene and oxygen, sulfur, ferric oxide, or other substances removing hydrogen as derivatives
- c. Ethene and ethyne.
- d. Ethene and ethanediol-1,2

B. Oxygen, Sulfur, Nitrogen, Halogen, and Metallic Derivatives of Hydrocarbons

I. Dehydration, Dehydrogenation, and Condensation of Ethanol (Table 20)

II. Condensation of Ethanol With Close Derivatives (Table 21)
- a. Ethanol and ethanal
- b. Ethanol and paraldehyde
- c. Ethanol and 1,1-dibromoethane
- d. Ethanol and 1,2-dibromoethane
- e. Ethanol and bromoethene
- f. Ethanol and ethyne
- g. Ethanol and ethanediol-1,2

III. Treatments of Higher Alkanols (Table 22)
- a. Propanol-2
- b. Butanol-1
- c. Butanol-2
- d. "Butanol"
- e. "Pentanol"
- f. 3-Methylbutanol-1
- g. 2-Methylbutanol-2
- h. 3-Chlorobutanol-1
- i. 3-Chlorobutanol-2

IV. Conversion of Butanediols and Butanetetrol (Table 23)
- a. Butanediol-1,3
- b. Butanediol-1,4
- c. Butanediol-2,3
- d. Butanetetrol-1,2,3,4

V. Conversion of Alkenols and Alkenediols (Table 24)
- a. Propen-1-ol-3
- b. Buten-1-ol-3
- c. Buten-1-ol-4
- d. Buten-2-ol-1
- e. Butene-1-diol-3,4

VI. Conversion of Ethers (Table 25)
- a. Divinyl ether
- b. Ethyl vinyl ether
- c. Ethyl α-hydroxyethyl ether
- d. Ethyl β-hydroxyethyl ether
- e. Dibut-2-enyl ether
- f. γ,γ'-Dihydroxy-di-*n*-butyl ether
- g. Diethyl ether
- h. Methyl α-methoxyethyl ether
- i. Ethyl α-ethoxyethyl ether
- j. Ethyl α-acetoxyethyl ether
- k. Ethyl α-chloroethyl ether
- l. Ethyl β-chloroethyl ether
- m. γ-Chlorobutyl, γ'-hydroxybutyl ether
- n. Methyl α-vinyl-β-iodoethyl ether
- o. Ethyl α-vinyl-β-iodoethyl ether
- p. *n*-Propyl α-vinyl-β-iodoethyl ether
- q. Isobutyl α-vinyl-β-iodoethyl ether.

VII. Conversion of Aldehydes (Table 26)
- a. Electrolytic reduction and condensation of ethanal
- b. "Dehydration" of butanal
- c. "Dehydration" of α-methylpropanal
- d. Action of ethanol on β-hydroxybutanal
- e. Action of ethanol on but-2-enal
- f. Action of ammonia on but-2-enal
- g. Action of aniline on but-2-enal

VIII. Treatment of Carboxylic Acids (Table 27)
- a. *n*-Butyric acid
- b. Isobutyric acid
- c. Isovaleric acid
- d. Acrylic acid
- e. Oleic acid
- f. Elaidic acid
- g. Pentadienoic acid

IX. Decomposition of Esters (Table 28)
- a. Crotyl acetate
- b. Crotyl trichloracetate
- c. Butane-1,3-diol-3-acetate
- d. Butane-1,3-diol-1-β-hydroxybutyrate
- e. Butanediol-2,3 diformate
- f. Butanediol-1,3 diacetate
- g. Butanediol-2,3 diacetate
- h. Butane-1,2,3,4-tetrol diformate
- i. 2,3-Butene-bis (ethylxanthogenic acid)
- j. Natural glycerides
- k. Woolfat, cholesterin and its derivatives

X. Catalysis of Cyclic Oxides (Table 29)
- a. 2,3-Epoxybutane
- b. Tetrahydrofuran
- c. 4-Methyl-*m*-dioxane

XI. Conversions of Cyclanols and Phenols (Table 30)
- a. Cyclobutanol
- b. 1-Methylcyclopentanol-3
- c. "Dimethylcyclopentanols"
- d. Cyclohexanol
- e. Hydroxybenzene
- f. 1,2-Dihydroxybenzene
- g. 1,3-Dihydroxybenzene
- h. 1,4-Dihydroxybenzene

XII. Treatment of Organic Sulfur Derivatives (Table 31)
- a. Divinyl sulfide
- b. Dibut-2-enyl sulfide
- c. Butadiene monosulfone

XIII. Decompositions of Organic Ammonia and Ammonium Derivatives (Table 32)
- a. 1,4-Diaminobutane
- b. Piperidine
- c. 3-Aminobutanol-1
- d. Cyclobutylamine phosphate
- e. Dimethyl but-3-en-1-yl ammonium chloride
- f. Trimethyl but-3-en-2-yl ammonium hydroxide
- g. Trimethyl but-3-en-1-yl ammonium iodide with alkali
- h. Trimethyl but-3-en-2-yl ammonium chloride with alkali
- i. Trimethyl cyclobutyl ammonium hydroxide
- j. Trimethyl 3-bromobutyl ammonium chloride with alkali
- k. Trimethyl 3-chlorobutyl ammonium chloride with alkali
- l. Dimethylethyl 3-bromobutyl ammonium iodide with alkali
- m. Dimethylethyl 3-chlorobutyl ammonium iodide with alkali
- n. Trimethyl 1-methyl-3-bromopropyl ammonium chloride with alkali
- o. Trimethyl 1-methyl-3-chloropropyl ammonium chloride with alkali
- p. 1,4-Butene-bis (trimethyl ammonium hydroxide)
- q. 1,4-Butene-bis (triethyl ammonium hydroxide)
- r. 1,4-Butene-bis (trimethyl ammonium chloride) with alkali

XIV. Conversions of Haloalkanes (Table 33)
- a. Action of chlorine on "chlorobutane"
- b. Catalytic cracking of 2-chloro-2-methylbutane
- c. Catalytic cracking of 4-chloro-2-methylbutane (i.e., 1-chloro-3-methylbutane)

XV. Conversions of Dihaloalkanes and Tetrahaloalkanes (Table 34)
- a. 2,3-Dibromobutane
- b. 1,2-Dichlorobutane
- c. 1,3-Dichlorobutane
- d. 1,4-Dichlorobutane
- e. 2,3-Dichlorobutane
- f. "Dichlorobutanes"
- g. 1,2,3,4-Tetrabromobutane
- h. 1,2,3,4-Tetrachlorobutanes

XVI. Conversion of Haloalkenes and Polyhaloalkenes (Table 35)
- a. Chloroethene
- b. Bromoethene
- c. Iodoethene
- d. 3-Bromobutene-1 and 1-bromobutene-2 mixture
- e. 3-Chlorobutene-1
- f. 3,4-Dichlorobutene-1
- g. 1,4-Dichlorobutene-2
- h. 1,4-Dibromobutene-2
- i. 1,4-Diiodobutene-2
- j. Butadiyne hexabromide

XVII. Conversion of Halocyclanes and Dihalocyclanes (Table 36)
- a. Iodomethyl cyclopropane
- b. Bromocyclobutane
- c. Chlorocyclohexane
- d. 1,2-Dibromocyclobutane
- e. 1-Vinylcyclohexene-3 dihydrochloride

XVIII. Carbonization of Coal (Table 37)
- a. Low-temperature carbonization
- b. High-temperature carbonization

XIX. Dissociation of Butadiene Heavy Metal Salt Complexes (Table 38)
- a. Butadiene cuprous chloride complexes
- b. Butadiene cuprous bromide complex
- c. Butadiene silver nitrate complex
- d. Butadiene mercuric acetate complex
- e. Butadiene mercurous nitrate complex

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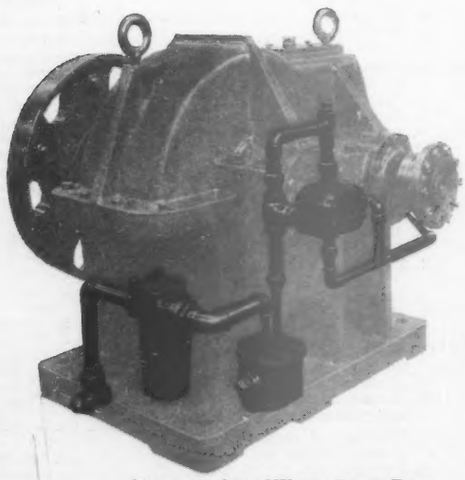

Phantom view of Westinghouse Type SU Speed Increaser unit showing oil pump, cooler, strainer and oil lines. All parts are external and easily accessible. Oil is continuously strained and cooled, preventing introduction of foreign matter into gear case.

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GEARED DRIVES

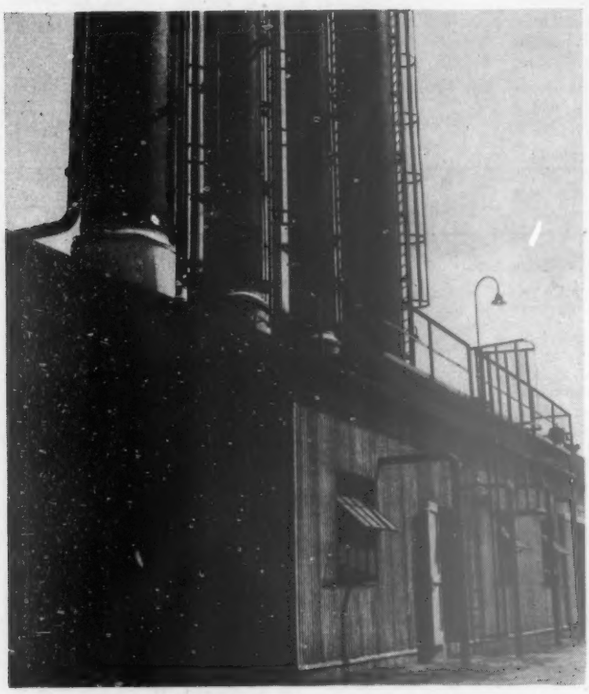
kanes reporting butadiene-1,3 among other products. The study indicates that propane, *n*-butane, and *n*-pentane are desirable stocks for thermal treatment on a recycle basis at high temperatures. The given equations indicate that dehydrogenation is a common reaction in the formation of butadiene-1,3 except in the cases of *n*-hexane and 2-methylpentane, where it is replaced by demethanation with deethanation also taking place. Demethanation occurs also, but to half the extent, in the corresponding thermolysis of *n*-pentane and 2-methylbutane. Deethanation is postulated for the conversion of propane into butadiene-1,3. The yields of butadiene are theoretically highest in the case of treatment of *n*-butane, where 93.1 per cent by weight is the limiting value. From a stoichiometrical point of view, 2-methylpropane has the same limiting percentage yield, although the probability of attaining this value is still lower due to the required isomerization.

(To Be Continued)

TABLE 1—THERMAL TREATMENT OF ALKANES

Alkanes		Apparatus used	Temp. (°C.)	Pressure (atm.)	Remarks (B = butadiene-1,3)	References
Methane	$4CH_4 \rightarrow C_4H_6 + 5H_2$	Quartz tube	950	.....	Reaction is not stoichiometrical. B yield = ?	E. N. Hague and R. V. Wheeler, Fuel 7, 535-539 (1928); J. Chem. Soc. 1929, 378-393.
Ethane	$2C_2H_6 \rightarrow C_4H_6 + 3H_2$	Quartz tube	750, 800, 850	.....	B was formed at all three temperatures. B yield = ?	E. N. Hague and R. V. Wheeler, Fuel 8, 560-587 (1929); J. Chem. Soc. 1929, 378-393.
Ethane + propane mixture	Probable reactions are: $2C_2H_6 \rightarrow C_4H_6 + 3H_2$ $2C_3H_8 \rightarrow C_4H_6 + C_2H_6 + 2H_2$	Quartz tube	800-850	1	Reactions are not stoichiometrical. B yield = ? Article not clear on conditions (Cu or Fe used as catalyst—?)	J. E. Zanetti and E. H. Leslie, Ind. Eng. Chem. 8, 777-779 (1916).
Ethane + propane mixture	Reactions above.	Quartz tube	850	1 (?)	Reactions not stoichiometrical. B yield = ?	J. G. Davidson, Ind. Eng. Chem. 10, 901-910 (1918).
Ethane + propane + ethyne mixture		Quartz tube (?)	550-950	1	B yield = ?	J. G. Davidson, Ind. Eng. Chem. 10, 901-910 (1918).
Propane	Probable reaction is: $2C_3H_8 \rightarrow C_4H_6 + C_2H_6 + 2H_2$	Quartz tube	727	1	B yield was 1.1% by weight on feed.	P. K. Frolich, R. Simard, and A. White, Ind, Eng. Chem. 22, 240-241 (1930).
Propane	Probable reaction is: $2C_3H_8 \rightarrow C_4H_6 + C_2H_6 + 2H_2$	Quartz tube	750, 800, 850	.....	B was formed at all three temperatures.	E. N. Hague and R. V. Wheeler, Fuel 8, 560-587 (1929); J. Chem. Soc. 1929, 378-393.
Propane	Probable reaction is: $2C_3H_8 \rightarrow C_4H_6 + C_2H_6 + 2H_2$	Tube and baffles both made of 28% Cr alloy	850	.....	Recycling was used. B yield was 5.0% by weight.	A. Cambron and C. H. Bayley, Can. J. Research 10, 145-163 (1934).
Propane + butane mixture	Probable reactions are: $2C_3H_8 \rightarrow C_4H_6 + C_2H_6 + 2H_2$ $C_4H_{10} \rightarrow C_4H_6 + 2H_2$	Quartz tube	800-850	1	B yields = ? Reactions not stoichiometrical. Article is not clear on conditions (Cu or Fe or Ni used as catalyst = ?)	J. E. Zanetti, Ind. Eng. Chem. 8, 674-678 (1916).
Propane + butane mixture	Probable reactions are: $2C_3H_8 \rightarrow C_4H_6 + C_2H_6 + 2H_2$ $C_4H_{10} \rightarrow C_4H_6 + 2H_2$	Carbon tube in circuit with a 50-kw. alternator	...	1.68-2.02	B yield = ?	J. E. Zanetti and G. Egloff, Ind. Eng. Chem. 9, 474-478 (1917).
Propane + butane + pentane mixture		Two concentric tubes of Cr-Ni steel. Inner zone had iron network for preheating feed.	700	1	B yield = ?	W. J. Piotrowski and J. Winkler, Przemysl Chem. 14, 49-64, 83-92 (1930); Petroleum Z. 26, 763-780 (1930).
n-Butane	$C_4H_{10} \rightarrow C_4H_6 + 2H_2$	Quartz tube	650, 700, 750, 800	.....	B yield = ?	E. N. Hague and R. V. Wheeler, Fuel 8, 560-587 (1929); J. Chem. Soc. 1929, 378-393.
n-Butane	$C_4H_{10} \rightarrow C_4H_6 + 2H_2$	Quartz tube	727	1	B yield = 2.9% by weight on feed.	P. K. Frolich, R. Simard, and A. White, Ind. Eng. Chem. 22, 240-241 (1930).
n-Butane	$C_4H_{10} \rightarrow C_4H_6 + 2H_2$	Pyrex tube	700	1	B yield = 0.42% by weight on feed.	C. D. Hurd and L. U. Spinca, J. Am. Chem. Soc. 51, 3,353-3,362 (1929).
2-Methylpropane	$C_4H_{10} \rightarrow C_4H_6 + 2H_2$	Pyrex tube	700	1	B yield was very low. The feed contained small amount of propane and 1 to 2% of *n*-butane.	C. D. Hurd and L. U. Spinca, J. Am. Chem. Soc. 51, 3,353-3,362 (1929).
n-Pentane	$C_5H_{12} \rightarrow C_4H_6 + CH_4 + H_2$	Glass tube	Bright red heat	1	B yield = ?	L. M. Norton and C. W. Andrews, Am. Chem. J. 8, 1-9 (1886).
n-Pentane	$C_5H_{12} \rightarrow C_4H_6 + CH_4 + H_2$		600	1 (?)	B yield was 3.0% by weight on feed per pass, calculating to 10% by weight on fully decomposed feed.	G. Calingaert, J. Am. Chem. Soc. 45, 130-135 (1923).
n-Pentane in the presence of steam	$C_5H_{12} \rightarrow C_4H_6 + CH_4 + H_2$	Quartz tube	700, 750, 800	1 in all cases	B yields were "less than 3%."	J. J. Morgan and J. C. Munday, Ind. Eng. Chem. 27, 1,082-1,086 (1935).
2-Methylbutane	$H_3C \cdot CH(CH_3) \cdot CH_2 \cdot CH_3 \rightarrow C_4H_6 + CH_4 + H_2$		600	1 (?)	Exit gas had 1% of "B and/or 2-methylbutadiene-1,3" by volume.	G. Calingnert, J. Am. Chem. Soc. 45, 130-135 (1923).
n-Hexane	$C_6H_{14} \rightarrow C_4H_6 + 2CH_4$	Isoprene lamp with Pt filament	500-600	.....		I. I. Ostromyslenskii, J. Russ. Phys. Chem. Soc. 47, 1,472-1,494 (1915); Translation S-152 in Feb. 6, 1942 Universal Oil Products Co. Survey of Foreign Petroleum Literature (by J. G. Tolpin).
n-Hexane	$C_6H_{14} \rightarrow C_4H_6 + 2CH_4$	Quartz tube	600, 650, 700	.....	B was formed at all three temperatures.	E. N. Hague and R. V. Wheeler, Fuel 8, 560-587 (1929); J. Chem. Soc. 1929, 378-393.
n-Hexane	$C_6H_{14} \rightarrow C_4H_6 + 2CH_4$	Glass tube	From 700 to a bright red heat	1	B yield = ?	L. M. Norton and C. W. Andrews, Am. Chem. J. 8, 1-9 (1886).
2-Methylpentane	$H_3C \cdot CH(CH_3) \cdot CH_2 \cdot CH_2 \cdot CH_3 \rightarrow C_4H_6 + 2CH_4$	Porcelain tube	Red heat	1	B yield = ?	L. M. Norton and C. W. Andrews, Am. Chem. J. 8, 1-9 (1886).

Refinery IDEAS ... that save $ $ $

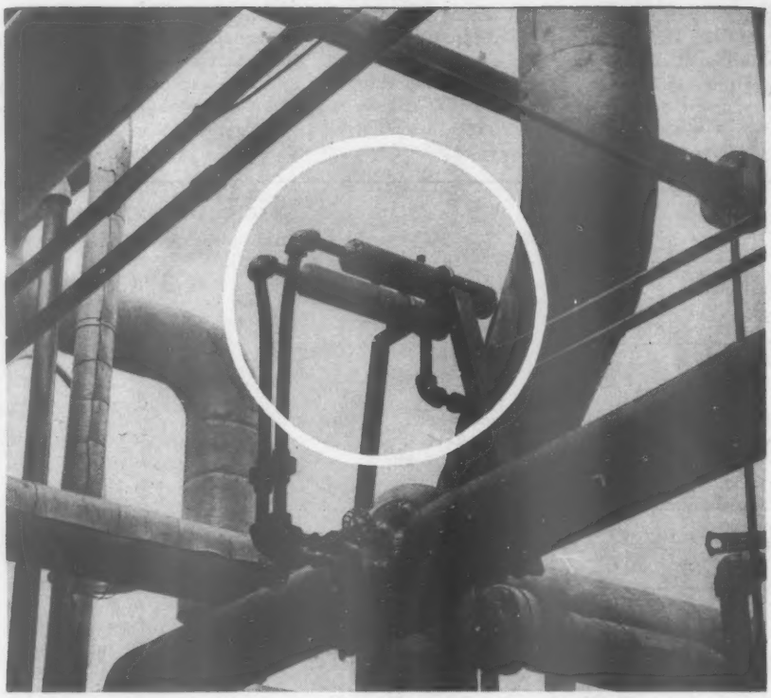


Fractionating Towers Extend Through Roof of Building

Normally, the control of fractionating towers is handled in a building somewhat removed from the towers themselves. Here, materials were saved and a closer coordination of operations accomplished by placing the controls in a building immediately under the towers. The platform on the roof of the same building serves all four towers as does the single safety ladder to the platform. The only special problem introduced by this method of construction is that of providing a tight seal around the tower where the roof and tower join. This is accomplished by use of a flexible, plastic material.

Air Traps in Instrument Lines

The small liquid lines that actuate an instrument in a refinery are usually subject to delayed and inaccurate readings as the result of air or vapor pockets developing in the meter line at elevated points. This trouble has been eliminated in one plant through the installation of short, horizontal nipples cut from pipe of several times the diameter of the meter line. By locating these in a horizontal position and at the highest point, any bubble of air or vapor which travels with the liquid will be



caught in the upper portion of the nipple. A plug, fitted into the upper, center portion of the little chamber can be removed in order to bleed the air and, of course, must be replaced tightly for operation of the meter.

Dual Means Provided to Start Compressors

Prepared to start up compressors with gas at any time any one of these compressors may be desired in service and independently of a single power source, one company has installed a small compressor driven by either gasoline or electricity. In the foreground are the two sources of power arranged on a platform with the starting compressor in the center. In the great majority of instances the power is supplied this compressor through the electric motor but in the few instances in which this power is cut off by storm or by other means, the small gasoline motor is at hand to start the small compressor which in turn supplies the compressed gas to start the large compressors in the background.

ABSTRACTS

of papers presented before the meeting of the Petroleum Division of the American Institute of Mining and Metallurgical Engineers, Austin, Tex., October 29-31

A RECONNAISSANCE STUDY OF THE ADAMS OIL FIELD, ARENAC COUNTY, MICHIGAN. By L. H. Esch, R. P. Grant, Geologists, and L. S. Miller, Engineer, Geological Survey Division, Department of Conservation.

A COMPLETE discussion of the physiography, history, structure, stratigraphy, and production of the Traverse pool, Upper Dundee pool, Lower Dundee pool and the Detroit River pool of the Adams field is presented. Producing gas-oil ratios and bottom-hole pressures are presented.

Apparently in the Adams field, conditions of permeability and porosity were more important than structure in accumulation of petroleum.

Conditions in this field lend weight to the theory that eventually oil fields will be found in the Michigan basin in which structure plays little part, but other types of stratigraphic traps control accumulation.

The Traverse pool is the oldest of the four pools. Recovery has been only 721 bbl. per developed acre. Ten of the original 14 wells have been abandoned. No encouragement is offered for extension of the pool.

Of the 31 wells completed in the lower Dundee, four are in the northern section of the field on the western border of the area in which the Upper Dundee pool is located. These four wells had the largest initial production of the lower Dundee wells but they are rapidly going to water. One has been abandoned because of water and further water advance may cause abandonment of the other three in the near future. The wells in the southern section of this pool make very little water with the oil and are in no danger of destruction by water in the near future. However, the daily production of oil per well is very low, and the pool may reach its economic limit in production within the next year or two.

The 16 wells producing from the upper Dundee form one of the most prolific group of wells so far drilled into any formation in Michigan. No water has encroached and reservoir pressure decline has been low. Available evidence indicates that large volume production may continue for a relatively long time. A possible connection between this pool and a closely adjacent oil accumulation of large proportions is indicated, or the evidence may be interpreted as showing that the pool limits may be extended beyond the area so far developed.

The Detroit River pool has four wells, three at the extreme southern end of the field and one at the extreme northwestern edge. The two areas of development are 3 miles apart. It is entirely possible that all or a portion of the territory between the two areas would produce oil.

The oil shows in the few wells that have penetrated the Detroit River formation offer possibilities of good production on future development.

In conclusion, further thorough search by geological study and drilling are fully justified by the evidence. Porosity and permeability need further study. Structure and uncomformities are also important in the Adams field and contiguous areas and the possibility of accumulation due to faulting should not be ruled out. All information from the Adams pool seems to indicate a nearby structure or zone of accumulation which should repay exploration. Wartime need justifies exploration to add to production of petroleum in Michigan.

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ASPHALTIC SUBSTANCES IN CRUDE OILS. By G. W. Preckshot, Standard Oil Co. of California Fellow, University of Michigan 1940-42; N. G. DeLisle, C. E. Cottrell and D. L. Katz, University of Michigan, Ann Arbor, Mich.

MOST crude oils contain asphaltic substances that may be naturally or artificially precipitated. In the Greeley field, California, this asphaltic bitumen is precipitated during the flow of the oil from the reservoir to the stock tank. The mechanism of such precipitation is not well understood. This paper presents the progress that has been made by using the electron microscope as a new tool and by observing the effects of the streaming potential on the formation of bitumen particles.

Crude oils at atmospheric pressure viewed in the electron microscope in very thin films under a vacuum showed no asphaltic particles. A technique of preparing slides of thin films by dilution of the oil with benzene and washing in petroleum ether was used at first, and these observations showed that the solvents caused the formation of the particles, varying from 0.01 to 0.2 micron in diameter.

The electrical effects of fluids flowing through porous solid were studied, with emphasis on the formation of colloidal particles by the streaming potential. The streaming potential of crude oil flowing through sand was measured and was shown to be responsible for the formation of bitumen particles. These results bring out a new phenomenon, which may occur when crude oil flows through the porous oil reservoir.

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DESIRABLE FEATURES OF NONTHIXOTROPIC DRILLING MUDS. By Eldon A. Means, Eldon Means Laboratories, Wichita, Kans.

NONTHIXOTROPIC muds have some properties and characteristics which seem a distinct advantage in drilling operations.

It was hoped that a determination of the various properties of such nonthixotropic muds, such as particle-size distribution, hydration, and plasticity would give an understanding of some of the observed effects in wells using this mud. Therefore the main object of this paper was to study such properties in the light of their performance in the field.

One characteristic is the ability of a drilling mud to remain in suspension. Usually in practical drilling there is a considerable amount of mud which has gone into suspension from the normal operation of the drill. It is into this material that additive muds are entered. Under these circumstances there is no difficulty in keeping nonthixotropic material in suspension.

The addition of salt water to the drilling mud makes no particular difference in the performance of nonthixotropic materials.

The author then discusses sedimentation, viscosity, ability to carry cuttings out of the hole, and hydration.

One of the greatest criticisms of nonthixotropic muds has been leakage as determined by the usual filter press method of the filtration process.

Only the cake resistance and the ratio of weight of wet solute free filter cake to its dry weight are factors relating to the kind of clay. That cake resistance is related to, and a function of, capillary size may be seen from Table 1.

TABLE 1—PARTICLE SIZE VERSUS FILTRATE

	Trial					
Microns radius—	1	2	3	4	5	6
3.5	100	93.5	91.3	87.0	77.08	69.2
.835	....	6.5	6.42	6.15	5.47	4.9
.450	....	....	2.28	1.98	1.75	1.57
.350	....	....	....	3.74	3.31	2.98
.232	....	....	....	1.1	1.97	.87
100	....	....	....	....	11.42	21.42
Theoretical voids	25.95	20.7	19.0	14.9	3.9	....
Filtrate per minute	100	80	75	50	20	13

Table 1 shows results when beginning with particle size of approximately 3½ microns and following the theoretical percentage. In Table 2 are expressed the results of reblending a nonthixotropic mud using particles only below 0.835 micron.

TABLE 2—REBLENDING OF CLAYS USING PARTICLES BELOW 0.835 MICRON

Material—	Filtrate in 30 min. (cc.)	Cake resistance
Unblended clay	75	20.2
Blended 10 per cent fines	40	52.0
Blended 20 per cent fines	28	150.0
Typical field clay	75	17.0

It can be seen from Table 2 that with the proper selection of particle sizes that the objection due to filtrate loss of nonthixotropic muds can be overcome.

It can be seen that if it were possible to control and choose the factors of particle size and hydration, that much could be done to give drilling fluids the desired properties. When materials are available with known particle size and hydration it should be possible to construct a drilling fluid of the desired properties by beginning with the fluid which is already in the hole.

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RESERVOIR ANALYSIS AND GEOLOGIC STRUCTURE. By J. M. Bugbee, Baroid Sales Division, National Lead Co., Houston, Tex.

THE engineer and the conservationist agree that effective water drive is the desirable reservoir production mechanism. Water drive may result either from the expansion of edge water, the reservoir water bordering an oil pool, or from the artesian flow of edge water from the outcrop. Thus, the extent of the reservoir has an important bearing upon both the rate and the ultimate quantity of water influx to an oil pool.

Lens-type reservoirs are generally recognizable, but the complete structure of the more important domal types, having possible limitations from crestal and synclinal faulting, is not well understood. The delineation from cores, electrical logs and exploitation phenomena of the crestal portions of reservoirs is increasingly exact. This paper suggests that interference from these factual pictures, combined with the scattered well and geophysical data of the synclines and the consideration of the dynamics of structural formation, may be applied to solving the complete geologic structure. Since faulting on the domes

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and in the synclines may effectively seal and thus limit the size of a reservoir and bar additional water influx, consideration of geologic structure and its possible effects is essential to complete analysis and prediction of reservoir performance.

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A RESERVOIR AND WELL BEHAVIOR ANALYZER. By W. A. Bruce, Carter Oil Co.

IN this method for analyzing petroleum-reservoir and well-behavior problems the porous continuum of the reservoir is assumed to be divided into small blocks or units. Each block is assumed to be small enough so that for a material balance on the fluids in the block an average pressure for the block can be used. To analyze reservoir behavior from this point of view by mathematical means, there would result a set of simultaneous difference equations (two for each block) which must be solved or combined into a partial differential equation. In the method described here, instead of solving these sets of equations analytically, electrical units are constructed which will behave in respect to the flow of electricity exactly as the reservoir units behave under various conditions of fluid flow. The electrical units are then wired together in the same way that the reservoir units are naturally connected by virtue of their geometrical locations and shapes.

Consider a block in a reservoir. Assume that reservoir fluid, or fluids, are flowing in one face and out the opposite face and that the block is small enough that at all points the stream lines are within 1° of perpendicular to the face. Furthermore, assume that the pressure at the upstream face is not over 1 per cent greater than the pressure at the downstream face.

A material balance will show that the mass of fluid flowing out less the mass of fluid flowing in will equal the change in density times the fluid volume.

The Electrical Analogy

Now consider an electrical circuit which is shown in the diagram, Fig 1.

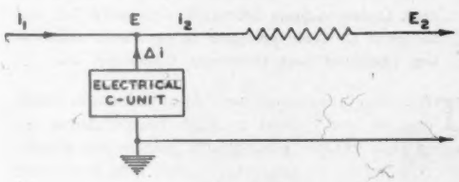

Fig. 1

The electrical C-unit acts as a device for electrical charge storage just as reservoir rock acts as storage for reservoir fluids. Hence, if current, i_1, flows in and a greater current, i_2, flows out of the unit, this difference in current must come from charge stored in the C-unit. If the unit is arranged so that for a net charge withdrawal there will be a corresponding reduction of potential, the qualitative analogy of this electric case to the fluid case is complete. In order for the analogy to be quantitatively exact and for current to be equivalent to fluid flow and pressure to be equivalent to electrical potential, certain functional relations must be established.

(The author then develops the mathematical relationship and describes the water-drive unit the oil-zone unit, application to gas flow, the gas-cap problem and the conversion from electrical to fluid units.)

The Dix pool (Jefferson County, Illinois) was set up in the analyzer which was divided for this problem into a pool unit and a water-drive unit. Wells were represented by ⅛-in.-diameter electrodes pressed into a 28 by 28-in. bakelite panel. Porous medium was represented by a 90 per cent glycerol and water solution of uniform thickness as the producing sand at Dix is uniform (about 30 ft.). For production the 76 wells were grouped together into 20 subgroups.

Operation and Results of Analyzer

In practice the production figures by wells are tabulated and grouped.

A timer starts calling time with 4 seconds equal 1 month and the well group switches are closed in accordance with the average time at which each group of wells are drilled. All during this the variable resistors are adjusted to keep suitably placed microammeters showing the proper average daily production.

Vacuum-tube voltmeters are connected to the well electrodes of the pool unit and a record of their readings gives the pool pressure at the electrode.

To fix the values of resistance of the water drive and pool units, values were chosen from the permeability and viscosity data.

Data through December 1939 were put into the analyzer. The resulting pressures from the analyzer were about 15 per cent too low.

The water-drive unit and pool unit were adjusted until the analyzer voltages seemed to agree best with observed pressures as far as the run was carried.

The synthesis of further pressure data beyond December 1939 was continued and the results for each group were as close to the observed pressures as they had been in the analysis phase of the run. Once the resistances were set by the history of the pool up to 1940, no further changes were made to carry the synthesis into 2½ more years of development.

Representative results are shown in Fig. 2, which shows the analyzer contours for January 1, 1940. Pressures measured December 26-30, 1939, are indicated at the wells.

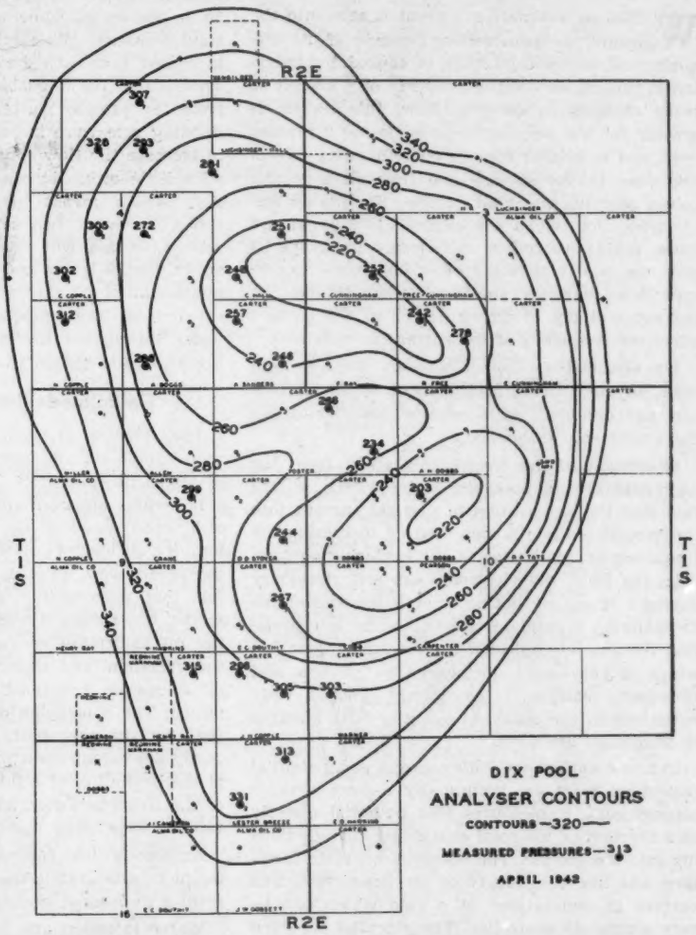

Fig. 2—Results from reservoir and well-behavior analyzer. Contours were drawn in early 1940 from data supplied by analyzer. Measured pressures in 1942 show that predictions of reservoir-pressure conditions were remarkably accurate

The author is indebted to B. M. Bradley, John Cooke, and Lois Cline for assistance in organization of data and operation of the analyzer and to the management of Carter Oil Co. for permission to publish this paper.

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GRAVITATIONAL DRAINAGE OF LIQUIDS FROM UNCONSOLIDATED WILCOX SAND. By Roscoe F. Stahl, Pan American Refining Co., Texas City, Tex., and R. L. Huntington, School of Chemical Engineering, University of Oklahoma, Norman, Okla.

IN certain volumetric oil fields the performance of the reservoir during the latter part of its producing life is governed to a large extent by the downward movement of liquid due to the force of gravity. This is especially true of formations having thick or tilting beds of uniformly high permeability, free of shale breaks. Leverett and Katz have presented original data and discussed the theory relating to the capillary and gravitational forces acting on liquids contained in a sand body. These investigators have pointed out the importance of such studies in the estimation of future reserves as well as the original fluid content of a reservoir.

In this previous work no data have been reported showing the history of saturation distributions during the drainage period. Since a knowledge of these transients is helpful in obtaining crude oil from such a reservoir, the authors have obtained these data during this investigation.

(The authors then describe the apparatus and procedure used in making the drainage tests.)

The curves, based on the data obtained, have the same general shape as those which have been reported by Katz and by Leverett. The marked wetability of Wilcox crude oil for quartz grains may account for the higher saturation in the upper portion of the sand body at the end of the run.

The depletion of a reservoir by gravitational drainage involves the unsteady flow of liquid downward. To picture such a flow process graphically calls for the securing of transient distributions of liquid at several times during the producing life of the field. Five such transients for Wilcox crude oil drained at 130° F. (the original temperature of the Oklahoma City Wilcox reservoir) were obtained.

Material balances on these runs checked fairly

well (±5 per cent) for the final equilibrium saturations.

Wilcox crude was drained down to equilibrium saturation (no further drainage) at 100° F. The rate was proportional to the temperature in the early stages but toward the end of the producing life, the rate at 130° F. fell below that of 100° F. or 115° F. The higher temperature did produce a slightly greater total recovery of crude oil.

The same relationship between temperature and drainage rate held true for three runs made on water at 64° F., 100° F. and 130° F., respectively.

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ELECTRIC EXPLORATION FOR OIL. By H. M. Evjen, Elflex Co., Houston, Tex.

WHEN an alternating current is sent into the ground, its penetration depends of its frequency of alternation. This is caused by inductance, that is, an inertial property of a circuit to resist changes in current. Now, this inertia is greater for the current loops enclosing a greater area, and is smaller for the current paths crowding close to the surface and thus close to the cables carrying the total current. For higher frequencies (for which the changes in current are more rapid), therefore, the deep current paths give rise to a relatively greater impedance to current flow than the shallower ones. Hence, the current will try to crowd nearer to the surface when the frequency of the current is increased.

The effect of the deeper portions of the ground upon any measuring arrangement at the surface can be computed with relative ease for direct current or zero frequency.

Separation of this measurable effect from the aggregate effects observed is by virtue of the fact that the penetration of electric current into the ground is rapidly decreased by increasing the frequency of alternation of the exploring current.

In the field, the electrodes are left stationary during a "run," so that no error is introduced due to changing proximate effects. In the interpretation the absolute value of the measured quantity, which is very much influenced by shallow and proximate features, is completely ignored. Only variations in the observed quantity with changes in frequency are used.

In broad outline the Elflex measures a potential picked up from the ground. By a potentiometer arrangement, it measures this potential directly as a fraction of the total energizing current flowing into the ground. The observed quantity therefore has the dimensions of an impedance. The current is commutated at a rate which can be very accurately controlled. The potential is picked up and commutated in synchronism with the current. The greatest care must be exercised in keeping the phase-relations here involved absolutely constant, and a special commutator has been designed for this purpose.

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RELATIONSHIP BETWEEN VELOCITY, OIL SATURATION, AND FLOODING EFFICIENCY. By R. C. Earlougher, Geologic Standards Co.

THE primary purpose for the use of flooding tests as a routine core-analysis procedure is to determine the amount of residual oil left in a sand after water flooding, and then to estimate the amount of recoverable oil present in the sand. However, it now becomes evident that such tests can be of far more value than for testing residual saturation or content alone. One of the most important results, thus far indicated by these laboratory tests, is the importance of velocity of water flowing through the sand and its relation to the oil recovery efficiency and per cent oil saturation at the time of the flood's inception.

Many engineers have long held that slower velocities of water encroachment through a sand will yield the greatest ultimate oil recovery, while others still maintain that the highest possible velocities will yield by far the greatest oil recovery. The data upon which this article is based very strongly support the theory that slower velocities are in most cases far more efficient than higher ones.

After data from the flooding of several hundred core samples had been assembled, oil and water-production time curves were drawn up for many of them. The study of these curves soon revealed that the ultimate oil recovery was independent of the flooding pressure—samples were flooded at different pressure varying from 5 to 50 lb. per sq. in. Some were flooded using a constant pressure, while others were flooded using increased pressures during the run. It became evident that the floodable oil was being produced from the samples just so fast, and that if the flooding rate were increased the only effect was to increase the flow of water through the sample with little or no increase in rate of oil production, which meant greatly increased water-oil ratios. Tests on two sets of samples from one core show this. One set was flooded at 5 lb. per sq. in. for 10 hours and the other at 40 lb. for 9 hours. Initial oil saturation, residual oil, and recovered oil were practically the same but the water throughout the water/oil ratio was much higher in the second case.

Calculated Flooding Efficiency

The flooding efficiency for each sample was then calculated and plotted against the velocity of water flowing.

It became apparent that in most cases the general trend was that the higher the velocity the less the efficiency. However, it was noted that the points were quite widespread. At first it was felt that permeability might be the governing factor, but finally it was discovered that the initial oil saturation seemed to be responsible for the variation, and then the relationship between oil saturation and flooding efficiency was determined. The conclusion drawn from these data is that, for the most part, flooding efficiency is directly dependent upon the per cent oil saturation at the beginning of a flood and upon the velocity of the flooding water, and that there is a critical velocity depending upon the oil saturation.

Numerous field records were studied in an attempt to substantiate the laboratory findings. The results were most gratifying.

Water injection and oil production curves for four different leases are given. The net feet of clean sand in all cases is approximately 30 ft., and so the data are plotted on a basis of barrels per day per acre. Two of the properties are leases drilled on 440 by 440-ft. spacing, while two are for 330 by 330 ft. and 330 by 377-ft. spacings. Three properties represent sands having a relatively low oil saturation of approximately 32, 28, and 34 per cent at the beginning of the flood, while the fourth represents a good saturation of about 40 per cent.

The injection rate used for the property having 32 per cent saturation averaged about 7½ bbl. per day per acre or about 1 bbl. per foot of sand per day. At the same time, the oil production came up to 2.4 bbl. per day per acre and remained at or above 2 bbl. per day per acre for 2 years. The water-oil ratio for the 4 years was 4.6 to 1, a good ratio for such a period.

The property with 28 per cent saturation also had an injection rate of about 7½ to 10 bbl. per day per acre, or 1.2 bbl. per foot per day. The oil production came up to approximately 2.7 bbl. per day per acre and held at around 2 bbl. per day per acre for about 18 months. During the first 3 years the water-oil ratio was very favorable, but at the end of that time the operator boosted his injection rates. The cumulative water together with water-oil ratio rose very sharply with little or no increase in oil production. In other words, the increased rate of water flow did little or no good. The over-all water-oil ratio was 7.1 to 1.

The property having 34 per cent saturation and developed on a 330 by 330-ft. spacing, shows the ill effects of too high an injection rate. Water was put in at a rate of about 25 bbl. per day per acre or 2.2 bbl. per foot per day. Oil production peaked at about 3.2 bbl. per day per acre in a relatively short time. However, the production then fell off very rapidly, so that at the end of 2½ years it was just about even with the first case cited in oil production and far behind in water-oil ratio. At the end of 3 years the water-oil ratio had risen to 17 to 1, which led to the early abandonment of the property and a low ultimate oil recovery.

The fourth lease, on the other hand, illustrates a sand with good oil saturation taking water at the rate of about 30 to 40 bbl. per day per acre with very satisfactory results. A good oil production rate of 6 to 7 bbl. per day per acre was obtained, and at the same time the water-oil ratio was held down to a very favorable level. The sand with a high initial oil saturation was adaptable to a much higher water injection rate than were the sands of low oil saturation.

It now appears that a water injection rate of 1 to 2 bbl. per foot per day is about the maximum that should be used on a sand of 30-35 per cent saturation. If the saturation is between 40 and 50 per cent, injection rates as high as 5 bbl. per foot per day may be used without encountering serious water-oil ratios and low flooding efficiencies.

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THE EFFECTS OF CERTAIN GUMS AND STARCHES ON FILTRATION OF SALT-WATER MUDS AT ELEVATED TEMPERATURES. By Frank Perkins graduate student, Louisiana State University, University, La., and Benjamin C. Craft, professor of petroleum engineering, Louisiana State University, University, La.

THE wall-building properties of salt-water muds can be maintained at high temperatures by using gum karaya, gum ghatti, gelatinized starch, or commercially prepared starch. A germicide should be used to prevent fermentation.

It has been found that of the many factors which have an adverse effect on filtration, the presence of electrolytes in general and salt in particular is outstanding. The effect is one of flocculation of the colloids due to neutralization of the negative charges on the clay particles. High temperatures reduce dispersion to a minimum causing increased flocculation in both fresh and salt-water muds. Filtration should be measured at the temperature actually anticipated in the well or at least at a number of lower temperatures and extrapolated over a small range.

The results of the fermentation tests are of interest. The gelatinized starch did not ferment in the laboratory or upon the addition of surface soil. However, it is believed that under well conditions bacterial action will take place. Gum karaya and gum ghatti showed slight fermentation upon the addition of surface soil, and the commercially prepared starch showed a marked tendency to ferment under all conditions. Fermentation in each case was readily prevented by the addition of one-half per cent by weight of commercial germicides, such as the sodium salt of trichlorophenol and pentachlorophenol.

CO$T Engineering

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

RIG OPERATION

NOVEMBER 5, 1942

ACCIDENT COSTS ALSO INVOLVE DAMAGE TO EQUIPMENT

COST of accidents is generally computed on a basis of man-hours lost due to injuries incurred during the work hours. To this is generally added the other factors, principally the cost of training a new man, loss in productivity for the entire crew during this training period and the additional bookkeeping involved. What is overlooked generally is the cost of damage to equipment, particularly if no one was injured in the mishap.

Actually this last-named factor is an extremely important one and may amount to more than the cost due to personal injury. At the same time the reduction in such costs can best be effected through a sound accident-prevention campaign designed to promote operating efficiency. The cost of such safety campaigns should not be charged entirely against the reduction in man-hours lost or insurance premiums reduced but should be considered in the light of prevention of damage to equipment.

The operation of a drilling rig presents several outstanding examples. Often when some very nasty accidents occur, there is no injury to the personnel. For instance, when a string of drill pipe is dropped, the crew may have been able to get in the clear and no one suffers any personal injury. However, in case an injury is suffered it is generally a major one and probably even fatal.

In such cases the drilling line is practically always snapped in two and is utterly worthless for further drilling purposes. This amounts to a direct outlay of around $700. In addition to that the elevators are broken or severely damaged and a new set must be purchased or the old ones repaired. The hook and traveling block are also likely to be deformed and sprung and in addition the rotary table damaged. In fact, one drilling contractor never got satisfactory service out of an almost new rotary table after it was the victim of just such an accident. The table required constant repairs and in a short time the bill for this work amounted to the cost of a new one.

Putting a fair estimate on the damage to the above items brings the total to a minimum of $1,500 and to a maximum of $5,000 with probably $2,200 being an average figure. This includes only the damage done to the equipment where the pipe is not dropped to the bottom of the hole due to the jumping of the tool-joint box or the spreading of the elevators. It also does not include approximately $300 time for repairing the rig so drilling can continue or the $100 trucking required to move in new or temporary equipment and rig it up.

In case the pipe is dropped, the bill really runs up. A minimum of a day and a half with good luck is then required to get the dropped drilled stem out of the hole. Actually, it may take 3 days, or a week and in some cases even a sidetracking job of even longer duration may be required. After the drill stem is recovered, it is no longer fit for further service without being straightened and the rig must be shut down until replacement pipe can be secured. Allowances of $700 rig time and $500 for repair and replacement of drill pipe are very conservative figures.

Tool Rental

There is also the rental of special fishing tools involved. It is unreasonable to expect that when the bit hits bottom the cones or cutters will not be knocked off. Often an attempt is made to pick up this junk with a homemade basket and this generally results in failure. Due to the peculiarities existing in the hole the first patented basket may not do the trick and it may be necessary to rent another, or several more, before the junk is recovered. This amounts to another $300.

The minimum required to clean up the fishing job caused by the dropping of the blocks and drill pipe thus mounts to $1,500 and added to the minimum damage brings the total for a possibly noninjury accident to $3,000. The maximum figure for the job can easily reach $10,000 or even higher with the average being around $5,000.

Another closely related type of mishap is running into the crown block with the traveling block. This may result in only jumping the lines out of the block, which will take from 30 minutes to several hours to repair. However, the sheaves are generally damaged either slightly or extensively. Actually, it is good policy to replace or completely recondition sheaves and bearings damaged by such accidents as small deformations in the sheave-groove contour will cause severe scrubbing and consequent short life of the drilling line. In other words, the contractor often goes on paying out small amounts of money because of a comparatively minor accident unless he replaces the damaged equipment. Such an accident generally costs only a few hundred dollars unless the drilling line is snapped or the derrick is pulled in, in which case the outlay jumps to the cost shown above for dropping the pipe, plus the cost of the damage to the derrick.

There are few cases where the drill pipe was dropped, or the crown block hit, which were unavoidable. Actually, most such accidents are the direct result of an unsound accident-prevention policy on the part of the supervisory personnel. Encouragement to the men to avoid personal injury carries with it the urge to prevent damage to the equipment.

Actually, both types of accidents described above could easily result in the severe injury or death of one or more members of the crew. The realization of the possible results of such a mishap is an added incentive to the men to check all the mechanical parts of the rig to assure its perfect working condition and to care for it in such a manner as to absolutely prevent such an accident. It also impresses on the crew the necessity of safe operation at a reasonable speed rather than dangerous operation at full throttle.

The cost of such a safe operating program is minute when compared with the result. Any expenditure for a supervisor charged with the responsibility of such work, or for a consultant from the insurance carrier, is more than repaid by the prevention of accidents which cause high industrial damage and possibly personal injuries.

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Now look at Figure 2. There you see how the concave side of the Gates Vulco Rope exactly corrects this bulging. It insures a perfect fit in the sheave groove with uniform side-wall wear and, therefore, longer life! It insures that the entire side-wall grips the pulley—heavier loads are carried without slippage—belts are saved and power consumption reduced.

Only belts built by Gates are built with the Concave side, which is a Gates patent.

What Happens When a V-Belt Bends

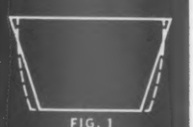
FIG. 1

FIG. 2

THE GATES RUBBER COMPANY

Engineering Offices and Stocks in All Large Industrial Centers

GATES VULCO ROPE DRIVES

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New York City 215-219 Fourth Avenue
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Denver, Colo. 999 South Broadway
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Portland, Ore. 333 N. W. 5th Avenue
San Francisco, Cal. 2700 16th Street

CO$T Engineering

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

PUMPING

NOVEMBER 5, 1942

REMODELING PUMPING EQUIPMENT RETURNS INVESTMENT QUICKLY

CONTINUED operation of old standard-style pumping rigs on properties producing small amounts of oil is an expensive proposition. Most of these units are powered by a large, single-cylinder gas engine which will not run satisfactorily below a certain speed. This speed is generally so high that the pump must be operated at more strokes per minute than is desirable or needed. Generally the minimum speed is 16 to 20 s.p.m. when actually 6 to 9 s.p.m. would be a much better speed from the standpoint of production and maintenance.

The cost of operating the large old-style engine was found by one operator to be $2.03 per day.* This includes only engine cost and does not take into consideration rod, tubing and other difficulties which are a direct result of higher pumping speeds. A breakdown of the engine maintenance cost is shown in Table 1.

TABLE 1—ENGINE MAINTENANCE COST PER DAY

Repairs (labor and material)	$0.61
Lube oil	.20
Fuel	.30
Labor	.92
Total per day	$2.03

The labor charge is for the daily oil and greasing periods which amount to six stops per day of 10 minutes each. A change in the pumping setup on the property showing the above costs, resulted in a reduction of $1.11 per day in the cost of operation. This is often sufficient to turn a marginal property into a profitable one.

Remodeling and modernizing of the pumping equipment can often be accomplished at a comparatively small investment which will be repaid in a short time by the reduction in operating costs. Efforts in this direction are at present hindered by the difficulty of obtaining equipment but in many cases the necessary items are available.

*Henderson, Glenn E., "Bandwheel Drives Pay Out Quickly," Los Angeles Basin A.P.I., Feb. 10, 1942.

One type of modernization is the conversion of the old-style rig front from a drive by a heavy engine through a countershaft and long belt to a band-wheel-type pumping unit. In this arrangement the electric motor or appropriate-size internal-combustion engine, is mounted on a base close to the band wheel and drives the band wheel through gear-reduction unit and a chain.

Generally such equipment is located in the older fields where gas produced with the oil has considerable value, in one case $0.05 per 1,000 cu. ft. at the well head. Approximately 3,000 cu. ft. per day was required for engine fuel for the pumping at a cost of $4.50 per month.

The average cost for electric current per well was $12.26 per month, or $7.76 per month higher than the value of the gas. The cost of maintaining the electric motors, in this case, was approximately $37 per month, so the combined cost for the electric motor was $29.26 less than for the old single-cylinder gas engine.

Changing over from the old to the new-style pumping arrangement required considerable investment, approximately $650.50 per well less the $100 obtained as salvage for the old equipment. It can be seen that this investment is returned by the saving in operating costs in approximately 18 months. Use of a modern engine, properly selected for size, with a gear-reduction unit will accomplish practically the same objective.

In addition to the remodeling programs, another avenue is open to operators of pumping properties through a complete check of the efficiency of the pumping arrangement. For instance one company checked its lubrication system on its pumping units and saved ½-hp. per pumping unit. In addition, the pitman bearings were replaced with a rocker-type bearing which effected a saving of an additional ⅛ hp.

In this case electric motors were being used but the same principle applies to operation of internal-combustion engine-driven units. Charges for electric current vary widely but one company's rate is $0.02 per kilowatt-hour for the first 100 kw.-hr. and $0.0065 for all over that amount. If normal requirements for current run approximately 3,100 kw.-hr. per month the reduction of ⅝ hp. results in a drop in cost for electrical current from $21.50 to $18.41, or approximately 14.3 per cent.

Checking the horsepower requirements before and after making any changes will enable the operator to determine whether such work is worth while. One company had a crew go over its pumping equipment which had been in operation for about 10 years. This crew checked the horsepower requirements and then made any repairs or adjustments indicated including rebabbitting of saddle and post bearings, realignment of beams and band wheels, tightening of the jack. posts, installation of oilers on the saddle and pitman bearings and balancing of the wells. The speed and stroke remained the same.

This work, accomplished at a very low cost, resulted in the reduction of 1 hp. per well. When using 3 to 5-hp. motors for pumping, it can be assumed that this reduced the cost of current requirements aproximately 25 per cent. In addition, there is the elimination of much of the work of maintenance crew required to repair rods and tubing.

As the pumping conditions change it is necessary to replace the prime mover if maximum economy is to be obtained. This can be done. The needed investment is often returned in a comparatively short time, after which a greater profit is realized from the operation. This was done by one company recently, large electric motors being replaced by smaller ones with a consequent saving of $10 per month in the power bill. The investment required was $225 per well. In the changeover, the speed of the wells was reduced from 16 to 9, or fewer, strokes per minute with a consequent elimination of rod breakage.

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Engineering Fundamentals

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL No. 48

NOVEMBER 5, 1942

PLACING A STEAM ENGINE ON DEAD CENTER

THE term "dead center" refers to the position of a reciprocating engine when the piston is exactly at one extreme end of its stroke. The engine is said to be at *head-end dead center* when the piston is at the extreme end of the stroke and nearest to the cylinder head. *Crank-end dead center* denotes the position of the engine when the piston is at the extreme end of its stroke nearest to the crankshaft.

In the testing of steam engines it is often desired to determine the clearance volume, i.e., the steam space enclosed by the piston, the cylinder head, and the valves when the piston is at dead-center position. A determination of the clearance volume requires that the piston first be placed in the dead-center position. It is essential, also, that the engine be on dead center when making valve adjustments. A slight error in the position of the crankshaft when the engine is thought to be in dead-center position may result in considerable error in setting the valves.

Trammel Method

The trammel method is very satisfactory for placing a simple horizontal steam engine on dead center. In employing this method, the engine is turned by hand in the direction that it normally runs until the piston is near the end of its stroke. Then, referring to Fig. 1, a mark, *A*, is placed on the crosshead with a mark, *B*, directly opposite on the crosshead guide. While the engine is still in this position, a pointed trammel, *C*, is placed in a punch mark on the floor or engine base and a mark, *D*, is made on the rim of the engine flywheel at the upper end of the trammel as indicated in the sketch. A trammel may be made from a steel rod or heavy wire by bending it into the proper shape and pointing the ends. (A trammel rod suitable for setting in a punch mark on a floor or top of engine base is shown in Fig. 2-*A*. One suitable for setting on the vertical side of engine base or frame is shown in Fig. 2-*B*.)

The engine is then turned, in the same direction, past dead center until the mark, *A*, (Fig. 1) on the crosshead again exactly coincides with the mark *B* on the guide. The position of the crankshaft and connecting rod at this time is indicated by dotted lines in Fig. 1. The trammel is then placed in the same position as before and a mark, *E*, made on rim of the flywheel at the upper end of the trammel.

Now, using a scale, string, or dividers, a point *F* is located exactly half way between points *D* and *E* and marked with a scratch on the rim of the flywheel. The engine is then turned until the mark *F* is exactly at the upper point of the trammel. The engine is now on one dead center. (Head-end dead center is illustrated in Fig. 1.)

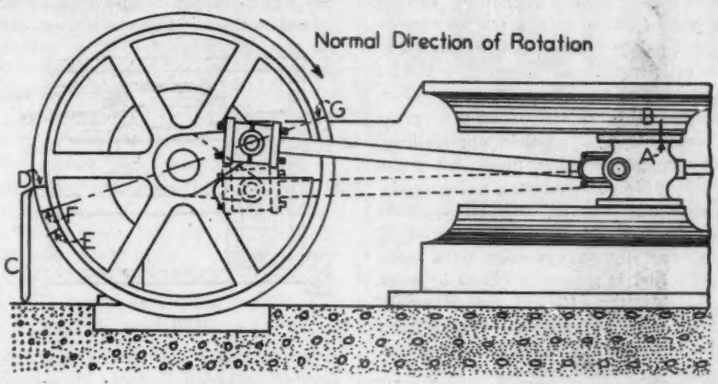

Fig. 1

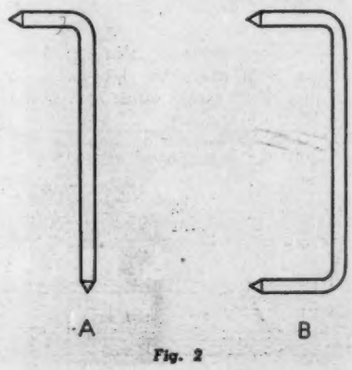

Fig. 2

To place the engine in the other dead-center position, the circumference of the outer face of the flywheel should be accurately measured with a steel tape. Then a distance equal to half of the circumference should be measured around the face of the flywheel and a mark scratched at *G*. Rotation of the flywheel until the mark *G* coincides with the upper point of the trammel will place the engine in the second (crank end) dead-center position.

In order to allow for any looseness of bearings at either end of the connecting rod, it is important that the engine be turned in the *normal* operating direction when approaching the trammel tip with a mark on the flywheel. This may make it necessary to turn the flywheel backward about a quarter turn and then finally approach point *F* or point *G*, as the case may be, with the engine turning in its normal direction. This precaution should be observed with particular care when setting valves on an engine that has been in service for a long-enough period of time that the bearings may show appreciable wear.

Series prepared by Glenn M. Stearns, associate professor of petroleum engineering, University of Oklahoma

Engineering Fundamentals

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL No. 49

NOVEMBER 5, 1942

D-SLIDE VALVE OPERATION

THE slide-valve steam engine employs but one valve per cylinder. More complicated valve mechanisms, often consisting of several valves on each cylinder, are on steam engines of greater refinement. Due principally to the simplicity in construction and operation of the slide valve as compared to the more intricate valve mechanisms, many of the engines used in oil-field service are of the slide-valve type. Although certain types of slide valves produce more frictional resistance and do not make as efficient use of steam as some of the more complicated valve mechanisms, this is not usually a great disadvantage in oil-field applications. The rugged service, under all types of conditions, requires a valve mechanism that can be easily understood and quickly adjusted or repaired at low cost by the average field man. Since fuel is generally cheap in most oil fields, the efficient use of steam thus becomes of secondary importance and is overshadowed by simplicity in operation and maintenance.

Slide valves may be divided into two general classes, namely: (1) Outside admission, or direct, by which the fresh steam from the boiler is admitted to the cylinder on the outside of the two ends of the valve and the exhaust steam escapes from the cylinder between the two ends of the valve; (2) inside admission, or indirect, by which the boiler steam is admitted between the two ends of the valve and exhaust steam escapes at the two outside edges of the ends.

The unbalanced D-slide valve must be of the outside admission type, so that the higher pressure of the live steam will hold the valve on its seat, rather than lift it off its seat as would occur if the valve were of the inside-admission type. Piston slide valves are usually designed for inside admission.

There are many variations in slide-valve construction depending upon the particular make of engine with which one is concerned. There are certain general principles regarding the setting of valves, however, which are common to all makes. In this series an effort will be made to discuss these general principles, at the same time pointing out variations in method that must be applied to various types of valve mechanism.

Since the simplest valve type is the plain D-slide valve it will be discussed first in order to obtain a basis for later discussion of more elaborate designs. As a basis for a discussion of valve setting it is necessary first to describe valve operation.

The accompanying drawings show various positions of a slide valve at important points during the cycle of travel of the engine piston.

In Fig. 1 the valve *A* is moving to the right. Steam is about to be admitted to the head end of the cylinder

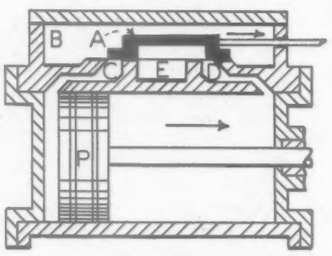

Fig. 1

from the steam chest *B*, through the port *C*, in order to force the piston to the right. This position of the valve is termed the *point of head-end admission*.

In Fig. 2, the valve *A* has moved to the right, stopped, and is now moving to the left. The valve is at the same position as shown in Fig. 1, but is moving in the opposite direction. During the interval of time that has elapsed since the position shown in Fig. 1, the steam has been flowing into the head end of the cylinder, but now the inlet steam supply is being shut off by the valve. However, the piston will continue to move to the right due to expansion of the steam already in the head end of the cylinder. This is the head-end cutoff position of the valve.

At the position shown in Fig. 3 the piston *P* is near the right-hand extremity of its stroke, and the valve *A* is moving to the left. Further movement of the valve to the left will allow steam to escape from the head end of the cylinder into the exhaust port *E*. This is termed the head-end release position of the valve. Shortly after the head-end release, crank-end admission occurs, due to further movement of the valve to the left which exposes the port *D* to the live steam in the chest *B*.

In the position shown in Fig. 4, the valve has been moved to the left,

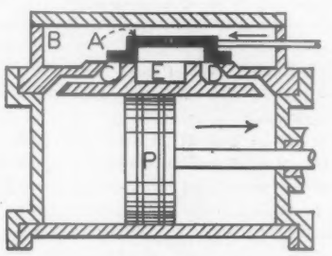

Fig. 2

stopped, and is now moving back to the right. The piston is being forced to the left by the expanding steam in the crank end of the cylinder. The exhaust of steam from the head end of the cylinder is being stopped by the valve *A* which is shutting off the passage from the head end into the exhaust port *E*. This is termed the point of head-end compression, since it represents the point at which compression of the steam in the head-end space begins in order to "cushion" the piston as it approaches the extremity of its stroke.

By a similar series of events, the valve controls the flow of steam into and out of the crank end of the cylinder. Thus, there are positions of the valve representing admission, cutoff, release, and compression on the crank end of the same relative sequence and timing as those on the head end.

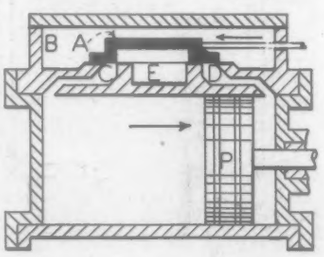

Fig. 3

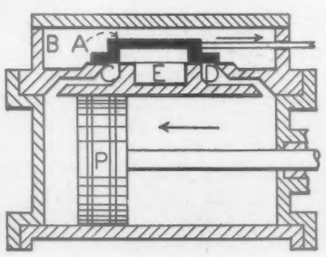

Fig. 4

Series prepared by Glenn M. Stearns, associate professor of petroleum engineering, University of Oklahoma

REFINERY ACTIVITY AND EXPANSION

Four Diversified Papers Presented Before W.P.R.A. Regional Meeting at Shreveport

SHREVEPORT, La.—Four papers on diversified subjects were presented here October 30 at the regional meeting of the Western Petroleum Refiners Association. Papers delivered at the all-day meeting were particularly appropriate for present wartime conditions. Metalizing, mercaptans, farm tractors, and synthetic rubber were main subjects but each paper was discussed from the refiner's viewpoint, showing, for example, how he can reclaim worn-out pump rods, or how he can patriotically assist in keeping existing farm-tractor equipment rolling for the duration.

J. R. Cox, engineer, Stanolind Oil & Gas Co. was chairman for the morning session. The first paper dealt with metalizing and was presented by J. E. Young, of the General Metalizing Co., Houston, Tex. Metalizing, or the building up a metal surface by means of a molten metal spray, has been practiced with more or less success for many years. Recently improvements in technique and mastery of several important details have caused this process to be more widely utilized The importance of proper preparation of the surface of large vessels was stressed. The molten metal should be applied within 1 to 3 hours after surface preparation in order to prevent the deleterious effect of humidity and air oxidation.

The use of propane instead of acetylene is now possible with the improved guns. In certain plants where propane is a by-product, and where acetylene is not readily available because of priorities, the use of propane is an advantage.

For the preparation of pump rods and small parts which can be lathed, it is recommended that the surface be undercut about 0.020 in. and then a rough thread, say 16 to 24 threads to the inch, applied. It has been found that the thread furnishes a good seat for the coat of sprayed metal. Nickel chrome alloy can be sprayed successfully with the new gun.

F. C. Moriarty of the Universal Oil Products Co., Chicago, Ill., discussed the refiners' mercaptan problem. The conventional doctor treating system has its problems of volume losses, loss in tetraethyl lead susceptibility, recovery cost and emulsions. The use of an efficient caustic wash as a substitute for doctor treatment has been suggested by petroleum technicians as a wartime measure to conserve litharge and tetraethyl lead without degrading the quality of the motor fuel. There are 30 to 40 efficient caustic washing units in use at the present time. These units are removing 60 to 85 per cent of the mercaptans from the gasoline and it is the opinion of unbiased men that in most cases this gasoline could be sold with the subsequent doctor treatment. Several refiners have initiated such a program and are marketing a motor fuel with a mercaptan content of 0.005 per cent and in one case as high as 0.01 per cent.

The Unisol treating system for mercaptan removal, employing methanol and caustic soda solution was discussed. Three plants are now in operation and when methanol in large quantities is made available at the end of the war, this process may find a wide application as an improvement over the conventional doctor treating system.

The afternoon session was presided over by R. B. Pierce, refinery manager of the Arkansas Fuel Oil Co., Shreveport. Dr. W. F. Faragher, of Houdry Process Corp., discussed the manufacture of butadiene and especially by the Houdry process. The manufacture of butadiene from butane or butylene can be accomplished at relatively low temperatures and pressures by catalytic action giving yields of approximately 65 to 70 per cent. Sufficient butane is available for the manufacture of our total annual requirements of synthetic rubber, Dr. Faragher said.

Experimental work now being conducted by Houdry has already shown promise for some interesting developments and improvements over present methods. New polymerizing agents, to replace styrene, and an improved method of purification of the butadiene are predicted.

The manufacture of some butadiene from alcohol may be necessary at the present time as a "quickie," but, during normal times the cost of butadiene from alcohol will be two to three times

Sketches of Plant Operators . . .

HERMAN K. ECKERT, a plant manager in the organic chemicals division of Monsanto Chemical Co., is among the new recruits to the ranks of petroleum-chemical technicians. Mr. Eckert, formerly manager of the Monsanto plant at Nitro, W. Va., has been transferred to Texas City, Tex., where he will occupy a similar position at the new installation producing styrene, one of the components for synthetic rubber.

The styrene produced at the Texas City plant of Monsanto Chemical Co. will be transferred to a synthetic-rubber polymerization unit operated by one of the large rubber companies and there combined with butadiene and other chemicals for the production of buna-S.

Mr. Eckert was graduated from the University of Akron in 1922 with a degree in rubber chemistry. He started his career as a development compounder with Rubber Service Laboratories, Akron, Ohio, now the rubber-service department of Monsanto.

He went into operations work at the Nitro plant of the Monsanto company in 1926 and progressed through the ranks of plant supervisor and operating superintendent before becoming plant manager in 1938, a position he retained until his transfer to Texas City.

Dr. Charles S. Comstock of the production staff of the Merrimac division of Monsanto at Everett, Mass., has been appointed production superintendent at the Texas City plant.

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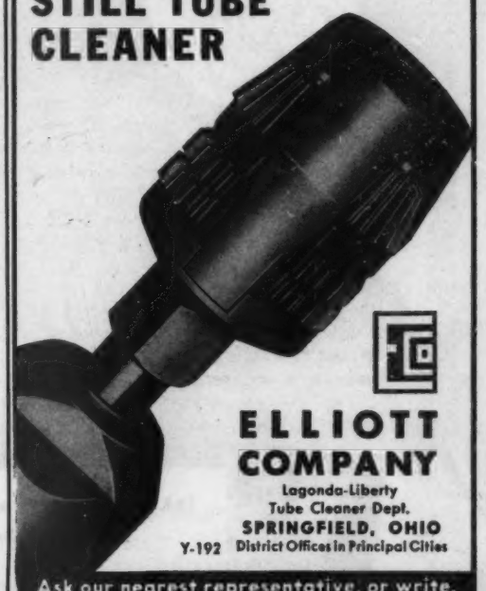

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the cost when manufactured from petroleum. Dr. Faragher predicted a bright future for synthetic rubber after the war. There will be a synthetic rubber that will be superior and more economical for whatever commercial application it may be called upon to fill. Natural rubber will have a limited use.

Dan Guy, of the Ethyl Corp., told of the educational work that his company has launched, efforts to assist farmers in keeping tractors rolling. The farmer has been called upon to produce about 50 per cent more food and he must do this with less labor and with the minimum of new farm machinery. Therefore it is necessary that the present farm equipment be kept in good mechanical condition and efficient operation. The refiner can assist in this program by cooperating with the educational projects and by studying the fuel and lubricant problems of the farmers.

Two Polymerization Plants Will Process Louisiana's Butadiene Production

Synthetic-rubber components produced at Baton Rouge and Lake Charles, La., by Standard Oil Co. of Louisiana and Cities Service Co. will be polymerized in two nearby plants to be operated by Firestone Tire & Rubber Co., it was announced at Cleveland, Ohio, last week.

Contracts for construction of the two polymerization plants have been awarded to the H. K. Ferguson Co., Cleveland. Defense Plant Corp., subsidiary of the Reconstruction Finance Corp., awarded the contracts and will own the installations.

The Citiese Service refinery at Lake Charles is a new project and will be one of the most modern plants in the country for the production of synthetic-rubber components as well as other war and civilian materials.

Standard of Louisiana is one of the pioneer producers of butadiene and its original facilities are now being augmented by substantially increased capacity.

Sinclair Rubber, Inc., Plant At Houston Progressing

HOUSTON, Tex.—Construction work is under way on Sinclair Rubber, Inc.'s butadiene plant near the Sinclair Refining Co.'s Houston refinery which will have a capacity of approximately 50,000 tons annucily. Sinclair Refining Co., Pan American Refining Corp. and Crown Central Petroleum Corp. will join in supplying the feed stock for the butadiene plant.

Polymerization and processing of butadiene into synthetic rubber will be handled by Goodyear Tire & Rubber Co., in a plant which will be constructed and operated under their supervision. Polymerization facilities adjoin the butadiene plant.

Styrene, the other major component of buna-S rubber, will come from a plant now being built under the supervision of and which will be operated by Monsanto Chemical Co. at Texas City, Tex.

The Sinclair Rubber, Inc., operation is scheduled to start production about the middle of 1943.

Kaiser Proposes Rubber Plant Near California Steel Mill

WASHINGTON, D. C.—Henry J. Kaiser, West Coast shipbuilder, is understood to have filed a proposal with William M. Jeffers, rubber director, for construction of butadiene and styrene plants in Southern California.

The proposal is to use benzol from the coke ovens of the Kaiser steel plant soon to be in production near Fontana, Calif., and alcohol to be produced at local wineries and by the Monarch Brewing Co. of Los Angeles. It is said that there will be sufficient benzol and alcohol available to produce 10,300,000 lb. of styrene and 34,400,000 lb. of butadiene annually, which would yield approximately 20,000 tons of buna-S rubber. A pending proposal to increase the size of the Fontana steel plant would approximately double the amount of benzol available. Mr. Jeffers has the butadiene and styrene proposals under consideration.

Furfural for Rubber Exempt From OPA Price Ceiling

WASHINGTON, D. C.—Furfural, a distilled oil of growing importance in the manufacture of synthetic rubber, is freed from price control to the extent sold or delivered for use in the manufacture of synthetic rubber, the Office of Price Administration announced October 30. The exception is that granted earlier to other ingredients of synthetic rubber.

The action was taken in Amendment 37 to Supplementary Regulation 1, effective October 29.

Inventories to Be Considered In Any Eastern Price Moves

WASHINGTON, D. C.—Distributors and dealers in gasoline and fuel oil along the eastern seaboard were assured last week by Leon Henderson, price administrator, that they will be given careful consideration as to any possible inventory losses if maximum prices in the area should be changed whenever OPA terminates its participation in the petroleum-transportation pool.

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Pipe-Line Activity

Digging-Up Operations Start on Del Rio Line

Work has started on digging up 277 miles of pipe line extending from the Yates field at Iraan to Lytle via Del Rio, Tex.

The pipe, after being taken up, will be loaded onto freight cars and shipped to construction points of lines being laid for the war program.

The line was sold by Illinois Pipe Line Co., the branch from Del Rio to the Yates field going to the Government and the line from Del Rio to Lytle going to Texas Pipe Line Co.

Eight-inch pipe was used in the 154 miles of line from Iraan to Del Rio and 10-in. pipe was used in the 123-mile line from Del Rio to Lytle.

It is estimated that 60 days would be required in taking the pipe up.

The line was built in 1926 and 1927, with Del Rio, Tex., as the central depot, with 27 tanks of 5,000 bbl. capacity each. A storm in 1934 smashed in 22 of the original tanks.

Work of taking up 254 miles of the Del Rio line has been contracted by Williams Brothers Corp., which has opened a field office at Del Rio in charge of George Allen, superintendent. Taking up the remainder of the line has been contracted by Sharman & Allen, successors to Latex Construction Co., which will use the pipe on a line now under construction for Texas Pipe Line Co., to provide outlets for southern Louisiana fields.

Champlin Buys Gathering Lines

Champlin Refining Co., of Enid, Okla., has purchased the gathering pipe lines of Pope-Virtus, Inc., in the Konawa and Grayson sectors of southern Seminole and Pottawatomie counties, Oklahoma.

The lines were originally built and laid to a loading rack on the Oklahoma City, Ada & Atoka Railroad. Champlin later entered the sector; the deal gives it control of the production in the area, ranging from 300 to 500 bbl. a day.

Ickes Discusses "Second Line" to East Coast

WASHINGTON, D. C.—Now that Petroleum Coordinator Ickes has convinced the War Production Board of the need for extension of the big 24-in. pipe line from Illinois to the East Coast, he has begun thinking seriously of the "second line" from the Southwest to the East, he said at his latest press conference.

Obviously pleased that he had been able to get WPB approval of the East Coast leg of the big line, Mr. Ickes was noncommital as to how soon he would ask for the second line, which would be for refined products and would, roughly, parallel the big crude line now under construction.

Looking back over the past couple of years, the coordinator said it was at least 24 months ago that he first warned of a shortage of petroleum products in the East, and 16 months ago he made the first application for the line which has just been approved *in toto*.

Mr. Ickes indicated that there was still some doubt about getting the eastern section of the "big inch" line completed as soon as hoped for, when he said that "if they give us priorities, I hope that it will be completed by June 1."

Mr. Ickes said he though it would be bad psychology to ask for steel for the second line now, since it has been but a few days since the WPB granted steel for the second part of the crude line, but added that it will become necessary in not too long a time. Since it would move lighter products, it would not necessarily be as large as the 24-in. crude line, he said.

Operations Start for Plantation Extension

Some double-jointing work is already in progress to prepare for the laying of 180 miles of 8-in. for the extension of the Plantation Pipe Line Co. system from Greensboro, N. C., to Richmond, Va. Most of the pipe for the project will come from the Illinois Pipe Line Co.'s system in the Del Rio, Tex., area. But the pipe which is being double-jointed now comes from another source. The route of the extension from Greensboro passes near Yanceyville, N. C., and Chase City and Blackstone, Va. The northern terminal is about 10 miles south of Richmond. Williams Brothers Corp. has established a field office at Greensboro. Operations are supervised by Thelma Davis. Within a week the work of laying pipe will begin.

Surveying of Route of W.E.P. Extension Is in Progress

Aerial surveys of the route for the second segment of the War Emergency Pipelines, Inc., project were made last year. Ground parties are now in the field staking out the precise route of the extension to the East Coast.

Because of the vital need for this line, it has become imperative to halt the drafting of men into armed services who are working on its construction.

Between Texas and the East Coast the line will have 25 pump stations, most of which will have three electric-centrifugal units, totaling 4,500 hp. at each station.

Surveying for the extension is being done by three engineering firms: Huey Cage; Lockwood, Kessler & Bartlett, and Midwestern Engineering & Construction Co., each of which is putting five parties in the field. Each of these parties will cover 1½ to 2 miles a day and will complete the survey before January 1.

To offset the effect of the diversion of East Texas oil to the 24-in. line, plans are being studied for supplying refineries in the Houston-Beaumont-Port Arthur area with sweet oil from the Corpus Christi area. Arrangements have been made already by Sinclair interests for laying a line for this purpose. Other interests are considering plans which may entail utilizing sections of natural-gas lines of Magnolia and United Gas Pipe Line for moving Corpus Christi crude.

An article describing the principal features of plans for extending the War Emergency Pipelines, Inc., project appears elsewhere in this issue.

Cabot Waits for Permit to Abandon Natural-Gas Line

Cabot Gas Corp., subsidiary of Godfrey L. Cabot, Inc., is waiting for permission from federal authorities which will enable it to abandon operation of 75 miles of 14-in. natural-gas transmission line, in order that pipe may be removed from the ground.

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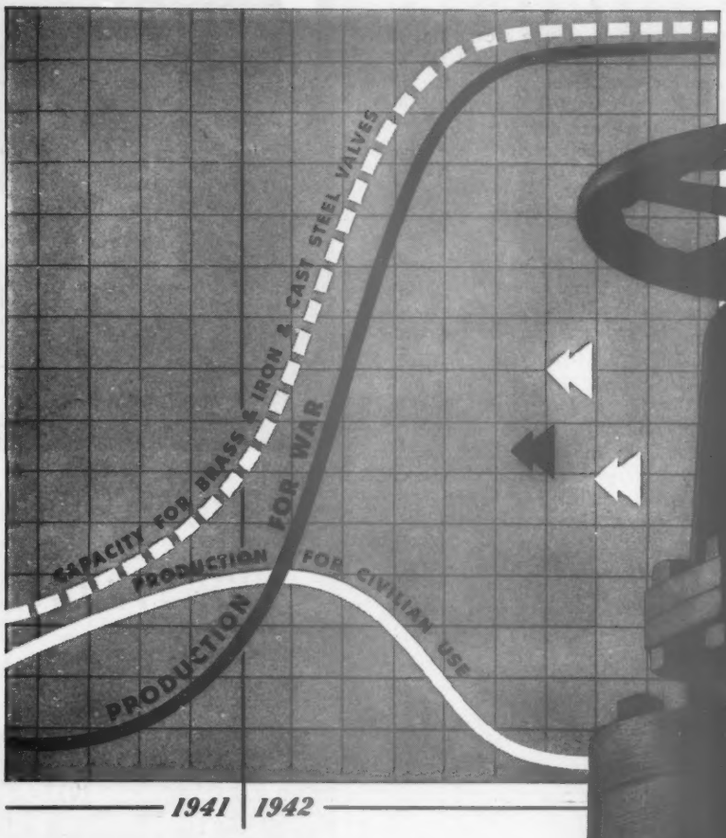

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FIELD DEVELOPMENTS...

HIGHLIGHTS FROM THE WEEK'S NEWS—

One of the ways of stimulating production that has been suggested is suspension of the 40-acre spacing rule for offsets to a discovery. This would have a two-fold advantage, on the one hand it would give the wildcatter at least three additional wells with a good chance for production in order to offset his losses on dry holes. Secondly, it would permit a more accurate delineation of the structure before it was necessary to step out ¼ mile for an offset.

The first of these provisions is met by a recommendation of Commissioner Olin Culberson of the Texas Railroad Commission that the allowable for a discovery well be placed at 100 bbl. daily for 18 months instead of the present 12 and that the new pool be exempted from shutdown days. This would have the effect of giving the successful wildcatter the equivalent of production from four wells under proration without the necessity of drilling three of them.

In his statement, Mr. Culberson says that much is being said about the patriotic duty of the wildcatter to go out and risk his money in a well which has, on the average, about one chance in eight of producing. It is also the patriotic duty of state regulatory bodies to encourage the wildcatter as much as possible. But patriotic duty should not stop here. It is equally the patriotic duty of purchasers to buy the oil.

With this point of view there seems little to criticize. It is futile to point out to oil men that a phenomenal producer from which all proration was removed in perpetuity by a grateful commission might put the discoverer in the poorhouse if he had no way of selling the oil. The wildcatter has risked his money. In granting him special privileges the commission runs the risk of headaches because of claims by others that they, too, are entitled to privileges or that the commission has no right to grant anybody any deviation from established rules. What does the purchaser risk?

His risks are few. He might lose money on the refining and marketing of the crude but he risks this on all crude that he buys. The crude might be of poor quality but he buys some of that now. He might have to store it. In this case, there are more than 5,000,000 bbl. fewer in storage now than there were at this time last year and if OPA finally relents and grants an increase in price then the purchaser has on hand low-priced crude which he can run and cut down proportionately on his purchasers of high-priced crude. If transportation facilities are not available, ways could be found to store the oil. A single 55,000-bbl. tank would hold the full 18 months' production from a discovery well under Mr. Culberson's plan and if a discovery well stands up that well, someone will find a way of getting the oil out.

It may be that this marketing difficulty is overrated but complaints are numerous enough to cause a member of the regulatory body of the nation's largest producing state to make a public statement on the matter. It may be that Washington expects these new reserves that it is demanding to be developed but not tapped but, if so, it is hard to imagine who will do the drilling. A government loan or subsidy on a successful wildcat will not do the trick because the wildcatter expects to use his successful wildcat to pay for the unsuccessful ones. A subsidy of dry holes might lead to an orgy of backyard drilling that would add little to the nation's reserves. As much freedom as possible from restrictions, satisfactory economic conditions, including a market, will cause those who know the exploration business to return to it.

OHIO: Prospects for a fair gas pool 2 miles east of the Clayton oil pool have been increased by the completion of a good gas well in the Clinton sand in that area. The Berea gas pool of Meigs County has been extended ¼ mile to the south (p. 66).

NORTH CENTRAL TEXAS: A new Mississippian lime pool has been opened in southwestern Young County and Strawn sand production is indicated in the Watson field of Clay County (p. 65).

SOUTHWEST TEXAS: The North Sun field has been extended to the north. The western end of the Wilcox trend is receiving much attention with three wildcats staked (p. 68).

CALIFORNIA: The productive limits of the Newhall Potrero field appear to have been extended about ½ mile to the northwest. Drilling in the Wilmington field still shows little increase although operators have been granted permission to drill additional wells to the bottom of the upper Terminal zone (p. 62).

WYOMING: The new Lakota sand discovery on the Horse Creek structure, Laramie County, swabbed 30 bbl. of oil an hour on its first test. A 2-mile extension south of the Tensleep sand discovery well in the Pilot Butte field, Fremont County, is in prospect (p. 60).

ILLINOIS: A large well has been completed in the Levias lime on the Jasper-Richland County line on the eastern side of the Dundas field. The Bible Grove field was extended to the southeast by a well in the Cypress sand (p. 69).

KANSAS: A new pool has been found southeast of Lindsborg and two others in Barton County (p. 71).

OKLAHOMA: A shallow pool has been opened in the Prue sand in Pawnee County. Carter County's new discovery well south of Ardmore made 240 bbl. on 1/8-in. choke (p. 66).

TEXAS GULF COAST: Potential discovery wells are reported in Austin and Montgomery counties as well as an important extension to Fig Ridge (p. 67).

NORTH and SOUTH DAKOTA: Principal activity is in the Black Hills area where information from deep water wells is being correlated with that from oil prospects (p. 60).

COMPLETIONS IN ALL FIELDS . . .

(Week Ended October 31, 1940)

	Oil	Gas	Dry	Total	Footage	Tl. comp. to date 1942	Tl. comp. to date 1941
N. Y., Pa., and W. Va.	60	24	3	87	152,057	2,970	4,993
Ohio	3	7	10	20	44,836	963	1,423
Indiana	0	0	1	1	1,105	302	431
Kentucky	0	0	0	0	0	219	558
Illinois	32	0	17	49	119,683	1,548	3,093
Michigan	1	2	4	7	14,733	598	756
Kansas	7	0	8	15	51,965	1,332	1,820
Nebraska	0	0	0	0	0	31	75
Missouri, Iowa	0	0	0	0	0	13	32
Oklahoma	12	0	9	21	64,171	1,006	1,596
Texas:							
North Central Texas	4	0	6	10	24,853	952	2,404
West Texas	11	0	4	15	69,039	1,153	1,915
Texas Panhandle	3	1	1	5	12,315	312	564
Eastern Texas	5	0	6	11	54,880	346	902
Texas Gulf Coast	7	0	2	9	64,318	601	917
Southwest Texas	10	1	11	22	112,735	906	1,572
Total Texas	40	2	30	72	338,140	4,270	8,274
North Louisiana	3	4	7	14	70,245	415	646
Louisiana Gulf Coast	3	0	1	4	31,155	421	721
Total Louisiana	6	4	8	18	101,400	836	1,367
Arkansas	3	0	1	4	25,466	152	170
Mississippi and Southeast	0	0	4	4	25,460	67	234
Montana	4	0	1	5	13,097	178	246
Wyoming	0	0	0	0	0	94	153
Colorado, Utah	0	0	0	0	0	20	27
New Mexico	4	0	0	4	13,837	226	236
California	11	1	1	13	41,698	629	938
Total United States	183	40	97	320	1,007,648	15,454	26,422
Total previous week	167	41	107	315			
Week ended Nov. 1, 1941	449	65	143	657			

Dakota Activity Centers Around Black Hills

RAPID CITY, S. D.—Despite war conditions, oil-exploratory work is continuing in the Dakotas this fall with four drilling rigs and four seismograph crews at work.

Three seismograph crews are operating in North Dakota and four drilling rigs and one seismograph party are working in South Dakota.

Interest in oil activities which was centered during the summer on the Carter Oil Co.'s well in Oliver County, North Dakota, has now shifted to the Black Hills area in South Dakota where the four wells are being drilled.

Carter Oil Co.'s North Dakota well, 1 Semling, SE SE 18-141n-81w, in Oliver County, was abandoned as a dry hole in September at 8,850 ft., after pre-Cambrian rock was encountered at 8,831 ft.

Black Hills Area Active

In South Dakota, Continental Oil Co.'s test hole on the Flint Hill structure, Chilson anticline near Edgemont in Fall River County, SE SE NW 36-8s-3e, where drilling was temporarily suspended early this month in the Minnelusa sandstone at 2,335 ft., is expected to be carried to below 4,000 ft. Manning & Martin, Denver, Colo., the drilling contractors, are using a large rotary rig. The well is in the same section as one drilled by H. L. Hollingsworth in 1925 in which oil showings were reported at 2,085 ft.

Fall River County is the site of another well being drilled on Hat Creek near Rumford, SE 5-11s-4e. Barry Annie, superintendent of the Hat Creek well, who moved in a larger rig this summer to replace one used last fall, said drilling will be carried down to "5,000 ft. if necessary." The well is being drilled for a Denver, Colo., group.

The two other wells are being drilled near Rapid City, north of the Fall River County locations.

John Arp 1 Gingrass, on Elk Creek in Meade County, north of Rapid City, SE NE 19-3n-7e, resumed drilling late in September after being shut down for several weeks. The well is being drilled by a syndicate of Wyoming oil men, headed by John Arp of Cheyenne. Stols Brothers of Denver are the contractors.

Drilling has been resumed on the Black Gap structure in Pennington County, south of Rapid City, after a temporary shutdown because of trouble with caving in the Lakota. The well, Andrews et al 1 Miser, is in NW NW 9-1s-8e. The hole has been drilled to about 800 ft. Started by Lem Johnston of Newcastle, Wyo., last fall, it was taken over by Albert Andrews this summer. Ed Jewell of Wyoming is the driller. A gas showing was reported at 300 ft.

The Continental Oil Co.'s well in Fall River County aroused the most extensive South Dakota leasing activity of the year along the Nebraska-South Dakota border with several major companies reported buying "protective" acreage in the area.

Much Acreage Under Lease

The Dakotas have been the scene of extensive leasing operations for the last 3 years. About 7,000,000 acres are under oil and gas lease in the two states. Lease men have been sent into the the states during the last three summers by many of the country's major oil companies.

The four seismograph parties, which are now operating in the Dakotas, represent: Carter Oil Co., which is maintaining a crew in the Belle Fourche, S. D., area; Texas Co., near Bismarck, N. D.; Amerada Petroleum Corp., out of Minot, N. D.; and Standard Oil Co. of California, around Rugby, N. D.

Crews representing several other firms worked in the two states during the summer, including Pure Oil Co., out of Belle Fourche; Geotechnical Corp. of Dallas, Tex., headed by E. P. Kennedy, in the South Dakota-Montana border area, northwest of Belle Fourche; and Independent Seismograph Service of Fort Worth, Tex., in Grant County, North Dakota.

Deep Water Wells Provide Information

Drilling of deep water wells on three federal projects in South Dakota this summer has been watched carefully by oil men because of the geological information they are providing.

A show of oil, encountered by water-well drillers in the Leo sand at the Black Hills Ordnance Depot in Fall River County, was partially responsible for the oil play that section of the state has received this summer.

A deep water well, being drilled at the Pierre air-base project near the center of South Dakota, is expected to reveal the nature of formations below the Sundance. The well will also check on magnetometer results reported by the South Dakota Geological Survey. Several natural-gas wells are located in the Pierre area.

Two deep wells, one 3,848 ft. deep and the other 4,645 ft., were drilled on the Rapid City air-base project.

Interest in northwestern South Dakota and southwestern North Dakota, scene of much leasing activity a year ago because of the drilling of an oil well south of Baker, Mont., near the Dakota line, was somewhat revived this summer with the announcement by the Carter Oil Co. that showings of oil were found at four depths, 6,815 to 6,825 ft., 8,320 to 8,350 ft., 8,455 to 8,500 ft., and from 8,644 to 8,659 ft. When the hole was acidized it produced 707 bbl. of fluid in 96 hours, 23 per cent water and the rest 27-gravity oil. The well was abandoned after the test.

ROCKY MOUNTAIN AREA

Lakota Sand Produces On Horse Creek Structure

By T. R. INGRAM

DENVER, Colo.—The General Petroleum Corp. 78-31-G, SW SE SE 31-17n-68w, reported a discovery in the Lakota sand on the Horse Creek structure, Laramie County, Wyoming, last week, swabbed 30 bbl. an hour on its first test at 5,530 ft. after setting 7-in. at 5,444 ft. The well was swabbed down to 1,800 ft., and the column of fluid could not be lowered below that level. The well has a hydrostatic head, but no gas and did not flow. Estimates place capacity of the well on the pump at around 1,000 bbl. a day and preparations are being made to install pump for a test. It is doubtful, however, whether the pumping test will show anything like the estimate as the equipment available will have a capacity of only 350 bbl. a day. The crude will average around 32 gravity although one sample tested showed 30.4° A.P.I. scale. It congeals at 37° to 38° F.

Elevation of the well is 6,780 ft., the tops as follows: Niobrara, 4,210 ft.; Muddy sand, 3,265 ft.; Dakota sand, 5,419 ft.; Lakota sand, 5,451 ft.; Morrison shale, 3,515 ft. There is no surface geology at Horse Creek. A gravity meter survey was made for another company by John H. Wilson, formerly with the Colorado School of Mines and subsequently with his own geophysical company. The General Petroleum Corp. later made a seismograph survey on the basis of which the well was spotted. Location has been made for a second well ½ mile to the south in No. 77-6-P, SW SE NE 6-16n-68w.

Tensleep Zone May Be Extended

A 2-mile extension south of the Tensleep sand discovery well in the Pilot Butte field, Fremont County, Wyoming, is imminent in Broderick & Gordon 1 Fidelity Trust, CEL SW SW 27-3n-1w. It had the top of the Muddy sand at 3,280 ft. and at 3,290 ft. a drill-stem test indicated a flow of 35,000,000 cu. ft. of gas a day. The sand is estimated to be 40 ft. thick. Extra precautions were necessary to keep the hole from cleaning itself. The well is 2 miles south of Superior Oil Co.-British American Oil Producing Co. 1 Tribal, SW SE SW 15-3n-1w, a discovery in the Tensleep at 6,184-6,325 ft. last April, which pumped 750 bbl. daily the first 2 days.

The Broderick & Gordon well is the second big gasser in the Muddy sand, which lies considerably above the Tensleep, at Pilot Butte. It is 1 mile south and a little west of Kinney-Coastal Oil Co. 1 Dykeman, which was completed in the Muddy sand in 1930. It officially gaged 81,928,160 cu. ft. in 24 hours, but at one time built up to 105,000,000 cu. ft. and made 61,000,000 cu. ft. after blowing wide open for 3 weeks. The new gasser may be on a separate high from the Tensleep wells to the north, although the area is faulted and considerable drilling will be necessary before the subsurface conditions are confirmed and the limits of the field determined. The gas in the new well probably will be cased off and the hole continued to the Tensleep. In the event it is a producer in that horizon it will mark an interval of 2⅛ miles between the most northerly and southerly wells with a possibility that the productive area may extend 4 miles to the northwest where British American is drilling a wildcat on the Steamboat Butte high.

Santa Rita Oil & Gas Co. 3 Jacobson, in North Cut Bank, a completion this week for 200 bbl. from the Cut Bank sand on a swabbing test, is in an interesting area. It is ¼ mile south and a little east of 2 Jacobson, which swabbed 135 bbl. in 24 hours and to the southwest of 1 Kruger, a gas well in the Sunburst sand.

Continental Oil Co. has released a location for

(Continued on Page 65)

PERMIAN BASIN, PANHANDLE

Wildcat Development Shows Little Promise of New Strikes

By W. D. THORN

MIDLAND, Tex.—West Texas wildcat activity during the past week failed to bring any promising signs of important strikes and neither was there any indication that a full-scale wildcatting program would be started in the district any time soon. Although there are a number of important tests now under way, most of them are major company operations, with independent operators practically excluded from the picture.

Phillips Petroleum Co. 9 University-Andrews, half-mile southeast of the Embar Ordovician discovery well, Andrews County, has been completed flowing 104 bbl. of oil daily plus 2 per cent water through open tubing from lower Permian pay at 6,210-75 ft., becoming the first producer in the field from this pay zone. Three other wells in this field are testing lower Permian zones with rather indifferent results, no flush production being indicated.

Atlantic et al 1-A Tex-U, deep wildcat in southwestern Andrews County, was drilling below 10,620 ft. in shale and lime, probably still above the Ellenburger.

Shell Oil 1 Ieaverton, Gaines County wildcat 4 miles southwest of the Wasson field, was drilling below 6,100 ft. in lime with no important shows.

Shell Oil 2 Sealy-Smith, new pay discovery in the Monahans pool, Ward County, perforated casing at 5,633-43 ft. and swabbed 9 bbl. oil hourly on initial test. It made 25 bbl. an hour through drill stem from pay between 5,595-5,650 ft. before cementing casing.

Shell Oil 1 W. D. Blue, Ordovician wildcat in Winkler County, was drilling below 6,480 ft. in Permian lime. Amon Carter et al 2-C Walton, deep test on the Keystone structure, is making hole below the regular field pay zone, no information being released. Various companies are contributing toward drilling of this well.

Skelly Oil 1 Richardson, southeastern Crane County wildcat, was abandoned last week at total depth 5,743 ft. in dolomite, after plugging back to 5,504 ft. and using 13,500 gal. of acid in the Ellenburger topped at 5,465 ft. It developed a small show of oil and water which was brackish but not sulfurous.

Phillips Petroleum 1 Ada Price, deep test in south central Pecos County, Section 11, Block 101, T.C.R.R. Survey, was drilling below 6,210 ft. in shale and lime.

Skelly Oil Co. 53 Halley, on southeast edge of the Emperor field, Winkler County, found the regular pay between 2,790-2,885 ft., almost shaled up, went into a sandy section at 3,257 ft., believed equivalent to the Weiner field pay, about a mile to the southwest. The well had no oil or gas shows in the lower zones, striking sulfur water from 3,420-80 ft., then plugged back and flowed 38 bbl. day through ⅛-in. choke after nitroglycerin shot at 2,790-2,885 ft.

New Ordovician Tests Staked

Two new Ordovician wildcat locations have been staked in the southeastern part of the Permian basin. In eastern Reagan County, Humble Oil 1 Sawyer Cattle Co., contracted to 8,500 ft., was located in NW Section 13, Block 1, T.&P. Survey. Humble owns lease rights below 3,500 ft. on approximately 168,000 acres out of the Sawyer 172,000-acre Bar S Ranch in Reagan and Irion counties.

The other deep project, contracted to 9,000 ft., is Col-Tex Refining Co. 1 W. N. Reed, in NW SW Section 8, Block 30, W.&N.W. Survey, northwestern Sterling County, being approximately 25 miles northwest of Ohio Oil 1 Clark, a new deep test in southeastern part of the same county.

Continued stead development in the 9,000-ft. Barnhart pool in Reagan County was foreseen as Amerada, with two wells now drilling below 8,000 ft., staked locations for two new operations in the field. Ogden & Hawn are completing their second producer in this field, No. 1-B University, through casing perforations at 9,185-9,200 ft. Sharples Corp. 1 Humble-University, same field, is drilling below 4,900 ft.

Sutton County Wildcat Encounters Gas Shows

S. B. Roberts and M. C. Moore 1 Allison, wildcat 15 miles east of Sonora in Sutton County, and in NW SW Section 25, Block K, G.H.&S.A. Survey, topped a lime section in the Pennsylvanian formation at 3,645 ft., encountered shows of gas at 3,650-3,710 ft., with an increase in sand at 3,720-35 ft. At total depth of 3,740 ft. in shale, it was making estimated 1,500,000 cu. ft. of sweet gas daily and drilling operations were suspended to run string of 7-in. casing. The well is scheduled to test the Ellenburger expected around 5,200 ft. It is a diagonal southeast offset to the old Southern Crude 1 Allison.

Livermore & Wahlenmaier 1 Thomson, wildcat at Hulldale in northern Schleicher County, is drilling below 3,000 ft.

Magnolia 1 Robertson, Pecos County wildcat 13 miles northwest of Fort Stockton, will move in rotary rig to deepen from present depth of 6,561 ft., where it tested salt water, to 7,500 ft.

Pure Oil 1 Odneal, quarter-mile south offset to the Chancellor pool discovery well in southwestern Pecos County, used nitroglycerin shot at 5,052-5,293 ft. in the Delaware lime and sand, was cleaning out cavings at 5,074 ft., with 4,300 ft. of fluid in the hole, showing some oil, with production prospects doubtful.

WEST TEXAS COMPLETIONS

Wildcats

Andrews County: Atlantic 1-C University, NE SW Sec. 24, Blk. 11, University Sur., deep test in West Andrews area, elev. 3,299 ft., broken stains and porosity 6,565-6,600 ft., dry, T.D. 6,600 ft.

Union Oil Co. of California 1-C A. C. Means, NW SE Sec. 23, Blk. A-36, P.S.L. Sur., 3 mi. SE Shafter Lake, elev. 3,202 ft., top lime 4,210 ft., top San Andres lime 4,523 ft., bailed est. total 4 to 6 bbl. oil day and 1½ bailers sulfur water hour, dry, T.D. 4,699 ft.

Crane County: Skelly Oil 1 E. R. Richardson, Sec. 5, Blk. 31, H.&T.C. Sur., SE part county, elev. 2,341 ft., top anhydrite 510 ft., top salt 800 ft., top Yates 980 ft., top frosted grains 1,010 ft., base

(Continued on Page 69)

EASTERN TEXAS FIELDS

Deep Wildcats Abandoned in Cherokee and Bowie Counties

By W. D. THORN

DALLAS, Tex.—Current activity in East Texas reflects little encouragement to those engaged in the search for new crude-oil reserves which, if found in that area, would have easy access to markets via the big pipe line which is expected to begin crude runs within approximately 60 days.

Marked off as dry holes last week were Magnolia 1 Braly, Cherokee County failure at total depth of 9,006 ft., O. W. Killam 1 Smith, Hopkins County Paluxy failure at 5,709 ft., and Magnolia 2 Campbell, semiwildcat at Concord in Anderson County.

P. D. Bowlen et al 1 Sims estate, Bowie County wildcat seeking Smackover lime pay, topped the Cotton Valley section at 7,060 ft. and was drilling below 7,390 ft.

Texas Co. 1 Strahan, eastern Nacogdoches County, ran electrical log to 7,661 ft., with no shows reflected and was drilling below 8,180 ft.

Delta Drilling Co. et al 1 Goldsmith, Wood County wildcat at Quitman, cored and drilled shale with streaks of sand showing oil stains from 4,057-4,107 ft., believed in the sub-Clarksville sand, was drilling below 4,200 ft. The showing is similar to nonproductive shows found in previous tests in the general area.

B. F. Phillips of Gladewater has made location for a third wildcat in the Friendship community, northeastern Smith County, at 1 V. P. Kay, in the southeast corner of a 211-acre lease in the Oscar Hawkins Survey. Proposed depth of 6,500 ft. will test the Paluxy.

Two good producers have been completed in the Kildare field, Cass County. Gilger Drilling Co. 1 Cass County Lands, J. Watson Survey, flowed 592 bbl. of 41-gravity oil through ¼-in. choke from casing perforations at 5,993-6,022 ft., in the Gloyd pay zone. Roger Lacy 1 Little, same survey, made 201 bbl. in 24 hours, through ¼-in. choke, from perforations at 6,041-56 ft. Beckett and Hicks, of Marshall, Tex., have filed application to drill four wells in this field, on the Kirk-Bell heirs' 161-acre tract in the J. Watson Survey.

E. E. Hurley et al 1 Frost Lumber Co., Shelby County wildcat, was shut down for orders after making a 10-minute drill-stem test at 6,772-86 ft. which recovered 360 ft. of mud and water and 630 ft. of salt water.

EAST TEXAS COMPLETIONS

Wildcats

Anderson County: Magnolia 2 Campbell, Concord area, J. B. McNeely Sur., top Woodbine 4,774 ft., top Georgetown 4,948 ft., dry, T.D. 5,088 ft.

Cherokee County: Magnolia 1 Braly, Joseph Thomas Sur., Mixon prospect, top Woodbine 4,258 ft., top Georgetown 4,884 ft., top Paluxy 5,990 ft., massive anhydrite 7,700-7,945 ft., Pettit 8,617 ft., Travis Peak 8,828 ft., dry, T.D. 9,006 ft.

Hopkins County: O. W. Killam 1 W. E. Smith, William Adams Sur., 1 mi. N of Cumby, top Georgetown 4,670 ft., top Paluxy 5,625 ft., dry, T.D. 5,709 ft.

(Continued on Page 63)

CALIFORNIA FIELD REPORT

Newhall Potrero Extended Half-Mile to Northwest

By L. P. STOCKMAN

LOS ANGELES, Calif. — Texas Co. appears to have extended the productive limits of the Newhall Potrero field 2,700 ft. northwest of nearest production but there is considerable difference of opinion among engineers because of the great disparity in electric logs of this well and wells known to be within the Newhall Potrero field. Texas Co.'s extension well was 1 Newhall in 22-4n-17w and it was finished flowing 350 bbl. of 30.6-gravity oil cutting 2 per cent and 340,000 cu. ft. of gas daily. It has been known for the past few weeks that Texas Co. had a promising oil sand but the company took its time testing several potentially productive intervals. The new well was drilled to 8,120 ft. and has 7-in. casing cemented at 8,060 ft. Prior to completion, tests were made at 7,990 ft. and 7,923 ft. but the perforations shot at these points were subsequently squeezed. Current production is coming from perforations at 7,812-78 ft. which gives the well 66 ft. of formation from which to produce. This outpost well of Texas Co. is about 1,250 ft. lower structurally than representative wells in the Newhall Potrero field but if subsequent developments prove this well to be located on the Newhall Potrero structure its completion will prove up all intervening acreage along the 2,700-ft. radius, a large part of which is held under lease by Barnsdall Oil Co.

This extension work by Texas Co. is of primary interest because the southeastern limits of production were extended in a somewhat similar manner. Several months ago, C. G. Willis and associates drilled an outpost on the Ferguson lease 1 mile southeast of production and succeeded in completing an excellent flowing well. Since that time, Barnsdall Oil Co. has completed one well in the intervening area and is putting the finishing touches on 32 Rancho San Francisco, a westerly offset to 1 Ferguson of Willis and associates. It is not yet clear what effect the new outpost of Texas Co. will have on the north end of the Newhall Potrero field but completion of 1 Ferguson earlier this year added about 350 acres to Barnsdall's proved acreage on the Rancho San Francisco lease. Willis and associates drilled 1 Ferguson to 7,519 ft. but later plugged back to 7,020 ft. and completed the well in the first Modelo zone of Miocene age. The second Modelo zone, which was topped at 7,020 ft., tested wet on a formation test at 7,020-7,120 ft. and the third Modelo zone, which was topped at 7,220 ft., was found barren. In 32 Rancho San Francisco, which is scheduled for completion within the next day or two, Barnsdall cored top of the first Modelo at 6,745 ft. and found top of the third Modelo at 7,300 ft. After finding the third Modelo barren, Barnsdall has plugged back the hole and will finish in the first Modelo zone. A second well is scheduled to be drilled on the Ferguson property within the next several weeks and the outcome of work will prove interesting as the outer edge of the field may not be very far away from the initial well.

Drilling Continued at Del Valle Deep Discovery

In the Del Valle field, R. E. Havenstrite is still working on his 2 Barnes which recently proved up the existence of an additional oil sand body below the third Modelo zone of Miocene age. Present depth is 8,525 ft. at which point the operator is drilling and spot coring. The new zone found in this well showed good oil sand at 8,130-70 ft. but on a formation test of the entire interval at 8,120-8,276 ft. the well showed a good gas blow but did not flow. Previously an interval at 7,866-7,975 ft. the well flowed at a daily rate of 3,000 bbl. of clean 41.9-gravity oil and 7,000,000 cu. ft. of gas indicating a high productivity. Both of these formation tests were made below the base of the third Modelo zone and the results to date indicate the upper portion of the new Barnes zone, which may be the equivalent of the deep zone at Aliso Canyon and Oak Canyon, has showed high-production characteristics whereas the lower portion, that section below 8,120 ft., has not yet shown much oil. Enough oil sand has been found in the upper part of the zone, however, to justify the expectation of finishing an excellent flowing well.

COASTAL DISTRICT COMPLETIONS

Gato Ridge, Santa Barbara County: O. C. Field Gasoline Co. 1 Texas fee, 4-8n-32w, pumped 170 bbl., 13.5-gravity, 5 per cent cut, T.D. 4,035 ft., perf. 3,505-4,005 ft., completed in Gato Ridge zone of Miocene age, logged poor oil sand in Pliocene at 2,145-2,345 ft.

Newhall Potrero, Los Angeles County: Texas Co. 1 Newhall, 22-4n-17w, flowed 350 bbl., 30.6-gravity, 2 per cent cut, 345,000 cu. ft. gas, 40/64-in. bean, flow pressures 100 lb., T.D. 8,120 ft., perf. 7,812-78 ft., completed in possible equivalent of second Modelo zone of Miocene age, located 2,700 ft. NW of nearest production in Newhall Potrero field.

Priority Fails to Increase Drilling at Wilmington

Drilling operations are not increasing in the Wilmington field of Los Angeles Basin as fast as had been expected but this is due to the fact that labor and materials are not available in large enough amounts to permit enlargement of work. Some time ago operators were given the green signal to go ahead with additional wells down to the bottom of the upper Terminal zone. This priority was given in order to increase drilling operations in the hope that additional production of heavy crude oil would result and thus offset to some extent the draft that has occurred in stocks of heavy crude and fuel oil. There are at least 100 locations available for drilling in the Wilmington field where production could be developed above the lower Terminal zone but many crews available are scattered throughout the state in other fields. Some new drilling is getting under way at Wilmington but at present the amount of drilling under way is the lowest in many months as just at present there are five strings of tools in operation. Foundations going in at Wilmington indicate that this rate of drilling may be continued unless some operator secures enough crews and equipment to proceed with additional work. The condition of fuel-oil stocks during the month of September when 2,064,203 bbl. were put in storage may tend to temporarily discourage additional drilling in fields producing heavy crude oil but operators should remember that this is due to a change in refining status and does not necessarily represent a reduction in the demand for fuel oil. It can be accounted for by the fact that refiners pulled 1,200,831 bbl. of light crude and 635,475 bbl. of heavy crude out of storage in addition to reduced liftings by the Navy. It is believed to be a temporary condition although the same condition may continue during October.

LOS ANGELES BASIN COMPLETIONS

Seal Beach, Orange County: Hellman Estate 15 Hellman, 12-5s-12w, pumped 209 bbl., 27.2-gravity, 0.6 per cent cut, T.D. 5,880 ft., perf. 5,431-5,621 ft., 5,692-5,878 ft., gun perf. 5,221-51 ft., 5,280-5,408 ft., originally drilled to 5,720 ft., where log showed all gray sand, set whipstock 3,175 ft., redrilled and deepened to 5,880 ft., completed in Selover zone of Miocene age.

Production Rate Reduced at Paloma Outpost Discovery

General Petroleum Corp. has pinched in 1 Gallagher in the Paloma distillate field with the result current production is 140 bbl. of 35.2-gravity oil cutting 0.2 per cent and 154,000 cu. ft. of gas daily. This reduction in production has been accomplished by reducing the bean to 7/64-in. behind which the well shows a casing pressure of 2,600 lb. and a tubing pressure of 1,650 lb. This splendid well is an outpost on the north flank of the Paloma field and substantially deeper than previous completions. The well is important because in addition to the amount of production secured, the well is producing a relatively low-gravity black oil. This tends to indicate that black crude oil may be expected around the periphery of the field at least in some sections of the field. Before any additional drilling can be undertaken in this field, permission must be secured from the petroleum coordinator as the bars are up against drilling in distillate fields. Union Oil Co. had a request pending for permission to drill in the Paloma field prior to completion of General Petroleum's Gallagher well but was turned down. Since being refused permission to drill, General Petroleum Corp. has completed its outpost and accordingly the situation may now be such that Union will be given permission to drill and test its Houchin property which is located not far from the Gallagher lease of General Petroleum. Obviously, if any considerable amount of drilling is tolerated in the Paloma distillate field, plans must be made to make available the necessary equipment to permit injection of natural gas produced from the reservoir. General Petroleum Corp. has had a location staked on the Benco property in 28-31s-26e farther down the structure than the Gallagher well but no decision has been made as to when work can or will be started.

Good Gas Well Completed In Rio Vista Field

One new gas well was completed during the current week and another is being prepared for early completion. The new well was Peter Cook 1 Cook, in the east end of the Rio Vista gas field of Sacramento County and it showed good production. Produced through the tubing and through the annular space between tubing and casing the well showed an initial daily production of 13,000,000 cu. ft. behind ⅝-in. beans. At the east end of Suisun Bay, Standard Oil Co. is still battling with 2-1 Suisun Community, a potential gas discovery well in 25-3n-1w, but may conclude drilling operations in the near future. This week the company found a hole in the 5½-in. casing and cemented a string of 4-in. tubing at 2,623 ft. This well has been a source of more trouble than 10 ordinary wildcats because of high gas pressure. It is generally conceded that Stanolind will have a new gas field to its credit if and when this well can be completed. Formation tests have proved conclusively that there is a large accumulation of natural gas present and all that remains is to drill and tap the accumulation. Standard's wildcat got into trouble shortly after being started and after reaching the gas sand begun to blow

out and erupt around the derrick due to the soft marshy condition of the ground around the rig coupled with the fact that gas was getting up around the casing. Up in Humboldt County, Texas Co. is putting the finishing touches on 2 Holmes-Eureka and at present is blowing gas from the well intermittently to clean out the mud. Texas has been supplying a local demand near Eureka and has been producing a small amount of dry natural gas for the past 2 years. This field has been designated as the Tompkins Hill gas field by Texas Co. which concern drilled the first commercial gas producer.

SAN JOAQUIN VALLEY COMPLETIONS

Belridge, South, Kern County: Belridge Oil Co. 66-33-A fee, 33-28s-21e, pumped 70 bbl., 15-gravity, 1.5 per cent cut, T.D. 880 ft., 120-mesh perf. 451-800 ft., completed in upper Belridge zone of Pliocene age.

Ohio Oil Co. 5 Emily Hopkins fee, 4-29s-21e, pumped 78 bbl., 16.1-gravity, 7 per cent cut, T.D. 840 ft., perf. 631-840 ft., completed in upper Belridge zone of Pliocene age.

Coalinga, East, Fresno County: Shell Oil Co., Inc., 71-32 fee, 32-19s-15e, pumped 218 bbl., 19.4-gravity, 1.5 per cent cut, T.D. 2,870 ft., perf. 2,730-2,800 ft., 2,820-70 ft., completed in East Coalinga zone of Pliocene age.

Fruitvale, Kern County: Petrolia Corp. 2-A Texaco, 26-29s-27e, dry, T.D. 3,658 ft., tar sand 3,000 ft., Fairhaven sand 3,343 ft., base Etchegoin 3,372 ft., Parker sand 3,430 ft., Martin sand 3,522 ft., only minor showings logged.

Kern River, Kern County: Standard Oil Co. 3-8 fee, 8-28s-27e, pumped 90 bbl., 14.1-gravity, and 50 bbl. of water, T.D. 2,900 ft., perf. 2,780-2,890 ft., M point 2,510 ft., N point 2,620 ft., Q point 2,702 ft., completed in Kern River series of Pliocene age.

Kern River Front, Kern County: Standard Oil Co. 29-15 fee, 15-28s-27e, pumped 55 bbl., 14.1-gravity oil and 27 bbl. of water, T.D. 2,365 ft., 100-mesh perf. 2,209-2,363 ft., completed in Kern River series of Pliocene age.

Lost Hills, Kern County: Universal Consolidated Oil Corp. 17-D, 30-26s-21e, pumped 130 bbl., 16.9-gravity, 4 per cent cut, T.D. 1,545 ft., perf. 905-1,543 ft., completed in upper Lost Hills sand of Pliocene age.

Midway-Sunset, Kern County: Bankline Oil Co. 3 M.S., 6-11n-23e, pumped 50 bbl., 17.8-gravity, 2 per cent cut, T.D. 2,285 ft., perf. 2,156-70 ft., 2,180-90 ft., completed in Etchegoin oil sand of Pliocene age, 2,063-68 ft., 2,100-17 ft., 2,152-69 ft.

Tide Water Associated Oil Co. 51 Midway, 2-31s-22e, recompleted pumping 69 bbl., 17.1-gravity, 2 per cent cut, T.D. 1,400 ft., perf. 722-44 ft., 827-72 ft., 880-1,102 ft., 1,125-1,394 ft., returned to production after being deepened from 1,102 ft. to Pliocene oil sand 1,400 ft.

Rio Vista gas field, Sacramento County: Peter Cook 1 Cook, 18-4n-3e, flowed 5,000,000 cu. ft. gas through ⅝-in. tubing bean and 8,000,000 cu. ft. through ⅝-in. casing bean at same time, T.D. 4,370 ft., perf. seventy ½-in. holes 4,305-67 ft., completed in Emigh zone of Eocene age.

Round Mountain, Kern County: Honolulu Oil Corp. 84 Round Mountain, 20-28s-29e, pumped 100 bbl., 19.6-gravity, 20 per cent cut, T.D. 1,950 ft., perf. 1,476-1,518 ft., 1,644-1,943 ft., completed in Vedder zone of Miocene age.

Eastern Texas

(Continued from Page 61)

McLennan County: C. G. Warren 1 Mary Dyer, George Green Sur., 3 mi. NW of Crawford, dry, T.D. 925 ft.

Fields

Weiland, Hunt County: Gulf 1 Greenville Lake, John Warren Sur., location abandoned.

Gulf 2 Greenville Lake, John Warren Sur., location abandoned.

Iowa-Payne Oil Co. 1 Morrison, W. T. Harris Sur., dry, T.D. 2,783 ft.

Hawkins, Wood County: Carter-Gragg Oil Co. 1 Little Sandy Hunting and Fishing Club, H. Woodland Sur., SW edge field, elev. 297 ft., base Austin chalk 4,497 ft., dry, T.D. 4,851 ft.

Humble B-1 Republic Ins. Co., H. C. Watson Sur., flowed 182 bbl. day, ¼-in. choke, gravity 30.7, gas-oil ratio 587:1, perf. casing 4,478-88 ft., T.D. 4,576 ft.

Humble 1 A. F. Sheppard, John Pelley Sur., pumped 102 bbl. in 6 hr., gas volume 113,000 cu. ft., elev. 422 ft., perf. casing 4,868-80 ft., T.D. 4,887 ft.

Humble 4 J. C. Snow, J. B. Crain Sur., flowed 150 bbl. day, ¼-in. choke, gravity 23.8, gas-oil ratio 253:1, T.D. 4,908 ft.

EAST TEXAS BORDER COMPLETIONS

Fields

Kildare, Cass County: C. C. Gilger 1 Cass County fee, J. Watson Sur., elev. 224 ft., Gloyd porosity 5,964-6,038 ft., base massive anhydrite 5,740 ft., perf. casing 5,993-6,006 ft., and 6,010-22 ft., flowed 592 bbl. day through ¼-in. choke, T.P. 700 lb., C.P. 940 lb., T.D. 6,063 ft.

Roger Lacy 1 Lela Little, J. M. Watson Sur., elev. 250 ft., Gloyd porosity 5,994-6,072 ft., perf. casing 6,041-47 ft., flowed 201 bbl. day through ¼-in. choke, T.D. 6,084 ft.

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APPALACHIAN FIELDS

Third Slippery Rock Test Has Small Show in Oriskany

PITTSBURGH, Pa. — In Slippery Rock Township, Lawrence County, T. W. Phillips Gas & Oil Co. at 17 ft. in the Oriskany sand in the test on the Delilah Hill found only a small showing of gas. The Onondaga lime was topped at 4,510 ft.; Oriskany 4,664 ft. with a showing of gas at 4,666-68 ft. The surface elevation is 1,197 ft. This is the third test in the area, the first on the Heickel farm having a good show of gas which was drowned out by water; the second on the Harry Myers farm which also had a fair showing of gas but uncommercial and no showing of water, and the present test which is still drilling but now through the sand.

SOUTHWEST PENNSYLVANIA COMPLETIONS

Armstrong County, Cowanshannock Township: T. W. Phillips Gas & Oil 1 Ann Patterson, 60,000 cu. ft. gas, Hundred-foot, Speechley, and Bradford, T.D. 3,486 ft.

Kittanning Township: Equitable Gas Co. 2 J. E. Heilman, 133,000 cu. ft. gas, Hundred-foot sand 1,380-1,498 ft., gas 1,388-98 ft., 1,404 ft., 1,443 ft., T.D. 1,498 ft.

Greene County, Center Township: Manufacturers Light & Heat Co. 1 A. H. Sayers, 285,000 cu. ft. gas, Bayard sand 3,378-3,415 ft., gas 3,402-07 ft., T.D. 3,454 ft.

Cumberland Township: Equitable Gas Co. 1 C. Y. Hathaway, drilled deeper, 132,000 cu. ft. gas, Big Injun 1,746-1,986 ft., gas 1,747 ft. and 1,864 ft., T.D. 1,986 ft.

Franklin Township: Waynesburg Home Gas Co. 1 Abner Tharp, 134,000 cu. ft. gas, Gordon sand 2,754 ft., gas 2,797 ft., T.D. 2,797 ft.

Gilmore Township: A. V. Lewis et al 1 Victoria Lemmons, 70,000 cu. ft. gas, Fifth sand 3,380-92 ft., gas 3,383 ft., Bayard sand 3,574-82 ft., gas 3,575 ft., T.D. 3,754 ft.

Jackson Township: Peoples Natural Gas Co. 1 J. B. Smith, 1,054,000 cu. ft. gas, Big Injun sand 2,290 ft., gas 2,360-65 ft., T.D. 2,373 ft.

Indiana County, Young Township: Apollo Gas Co. 1 Sarena J. Armstrong, 1,100,000 cu. ft. gas, gas 1,951 ft., T.D. 1,951 ft.

WEST VIRGINIA

In Trapp Hill district, Raleigh County, Godfrey L. Cabot, Inc., reached 1,990 ft. on the Rockhouse Fork Land Co. and shot with 40 lb. dynamite and 5 qt. to straighten the hole. It was gaging 90,000 cu. ft. gas from the Maxton sand before shot which increased to 340,000 cu. ft. It will be drilled ahead. In Marsh Fork district, Columbian Carbon Co. 663 Rowland Land Co. is drilling at 2,152 ft. in gray limestone and gaging 21,000 cu. ft. of gas.

In Wyoming County, Godfrey L. Cabot, Inc., is cleaning out No. 1046 on the C. C. Sharp farm in Center district and it is gaging 622,000 cu. ft. of gas in the Big lime. In Slab Fork district, Ravenscliff Development Co. 14-15 Wyoming Pocahontas Coal Co. was bottomed at 2,698 ft. with the Big lime 2,345-2,695 ft., and Big Injun 2,695 ft. It gaged 75,000 cu. ft. gas before acidizing and after acidizing with 1,000 gal. gaged 127,000 cu. ft. It was reacidized with another 1,000 gal. with no gas increase. The rock pressure is 665 lb. 30 hours.

WEST VIRGINIA COMPLETIONS

Boone County, Washington district: Hope Natural Gas Co. 8629 Dora E. Hopkins, 190,000 cu. ft. gas after shot, Big lime 1,758 ft., Injun 1,933 ft., Berea 2,429 ft., T.D. 2,483 ft.

Calhoun County, Sherman district: Connolley & Weaver 2 Alva Elliott, 6 bbl., Injun sand, T.D. 2,064 ft.

Clay County, Henry district: Pittsburgh & West Virginia Gas Co. 7870 Elk River Coal & Lumber Co., dry through Injun sand, T.D. 2,240 ft.

Doddridge County, McClellan district: Hope Natural Gas Co. 4933 Mrs. W. S. Haddox, drilled deeper, 440,000 cu. ft. gas, Big Injun sand 1,869 ft., T.D. 2,264 ft.

Gilmer County, Glenville district: Pittsburgh & West Virginia Gas Co. 7887 W. H. Frost, 60,000 cu. ft. gas, Big Injun sand 1,830 ft., T.D. 1,876 ft.

Hancock County, Grant district: R. J. Braden & Co. 32 Hewitt heirs, ½ bbl., Berea, T.D. 865 ft.

Lewis County, Freemans Creek district: South Penn Natural Gas Co. 10 Joseph Krenn, about ½ bbl., Gantz sand, may not be produced, T.D. 2,146 ft.

Lincoln County, Washington district: United Carbon Co. 6 Lincoln Mineral Co., 25,000 cu. ft. gas, brown shale, Berea 2,440 ft., brown shale 3,641 ft., T.D. 4,075 ft.

Putnam County, Curry district: Midway City Gas Co. 7 Switzer heirs, 179,000 cu. ft. gas, Berea, 2,100 ft., T.D. 2,134 ft.

H. H. Baker 3 Maude Smith, 94,000 cu. ft. gas, Berea 2,304 ft., T.D. 2,330 ft.

Dennis M. Roy 1 Turner Hall et al, 94,000 cu. ft. gas, Berea 2,286 ft., T.D. 2,330 ft.

Teays Valley district: Teavee Oil & Gas Co. 2 Forth & Erwin, 18,600 cu. ft. gas, Berea 2,128 ft., T.D. 2,592 ft.

Ritchie County, Clay district: Pine Valley Producing Co. 2 Strickler & McGinnis, 3 bbl., Maxton sand, T.D. 1,628 ft.

Grant district: South Side Gas Co. 3 Myrtle Powell, 30,000 cu. ft. gas, Big lime 1,475 ft., Salt 1,360 ft., Maxton sand 1,437 ft., T.D. 1,710 ft.

Murphy district: Pittsburgh Oil & Gas Co. 3 Fred Lemon heirs, 10 bbl., Maxton sand, T.D. 1,675 ft.

Wirt County, Clay district: Louis Reed 1 F. Rex estate, dry, Berea 1,750 ft., T.D. 2,550 ft.

ORISKANY GAS FIELDS

Jackson County, Ripley district: Godfrey L. Cabot Inc., 1061 J. L. McLean heirs, 9,100,000 cu. ft. gas, Oriskany 5,162 ft., shot 5,164-94 ft., T.D. 5,232 ft.

United Carbon Co. 1068 Rondus Winters, 7,959,000

(Continued on Page 71)

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Open Mississippian Lime Pool In Southwestern Young County

By W. D. THORN

WICHITA FALLS, Tex. — Opening of a new Mississippian lime field in southwestern Young County and indications of Strawn sand production in the Watson field of Clay County attracted attention of North Texas operators last week.

Standard Oil of Texas and Hanlon-Buchanan, Inc., 1 Sallie R. Donnell, wildcat in NE NW Section 2371, T.E.&L. Survey, 14 miles southwest of Newcastle, Young County, gaged 256 bbl. of oil in 24 hours through open tubing after terating with 500 gal. of acid in Mississippian lime pay at 4,466-4,503 ft. The well had flowed 75 bbl. in 24 hours, natural. The discovery increases possibilities for Mississippian production on other prospects on the western flank of the Bend arch.

Whitaker Oil Co. has cemented 6-in. oil string at 3,658 ft. in the 1 J. L. Cragg to make production test of Strawn sand showing oil from 3,658-80 ft., the total depth. Before setting pipe, a drill-stem test on this sand recovered 120 ft. of oil and mud. The well is in the northwest corner of Section 2672, T.E.&L. Survey, Watson field, Clay County, where the regular pay is found in the 5,200-ft. Caddo zone. Shell Oil has developed good production from several Strawn sands above the 3,600-ft. level in the Antelope pool a couple of miles to the south.

Youngblood and Foree et al 1 Sanzenbacher, wildcat 4 miles southwest of Henrietta, Clay County, was drilling below 5,700 ft. with no Caddo lime reported to that depth.

Continued testing at two prospective discoveries has furnished only mediocre results. Stanolind 1 Menasco, Wise County, from perforations at 5,790-5,810 ft., failed to flow steady and after swabbing for several days was recovering 6 bbl. of fluid per hour, about 55 per cent oil, balance heavy mud and water. Observers rate it good for probably 100 to 150 bbl. daily.

Sinclair Prairie 1 Eanes, southwestern Montague County, testing through perforations at 5,912-22 ft. and 5,828-40 ft., was opened to take potential test but after flowing 42 bbl. oil the first hour and 5 bbl. the next 10 minutes, went to gas. Later it produced 70 bbl. of oil over a 24-hour period.

Sinclair Prairie 2 Henderson, twin hole to a junked wildcat in the Denver area, W. E. Martin Survey, Montague County, showed some oil and salt water on last test at 6,050 ft. and has squeezed again.

Barnsdall Oil Co. has entered the deep wildcat play in Jack County on a joint-interest operation with Youngblood and Foree. These operators have made location for 1 Lizzie Garrison, for a 6,000-ft. rotary test in the northeast part of the Thos. Nash Survey A2021, 9 miles south of Jacksboro.

Taubert & McKee et al continue working on plans to drill a second test in the Post Oak area, Jack County, where their 1 Boyd was completed as a pumper from the 6,300-ft. Ellenburger dolomite. Tentative location for the next well is 2,700 ft. south of the discovery.

NORTH CENTRAL TEXAS COMPLETIONS

Wildcats

Clay County: Chester Clark 1 M. Chapin et al, Blk. 86. Byers Bros. Sur., location abandoned.

Fields

Muenster, Cooke County: C. & L. Oil Co. 9-A J. J. Perkins, T. F. Bates Sur., A-41, dry, T.D. 1,247 ft.

Thornberry, Clay County: J. W. Culbertson 1 J. J. Johnston, K. McKenzie Sur., A-328, dry, T.D. 1,344 ft.

Fortex Oil Corp. 1 Dallas Joint Stock Bank, Sec. 35, J. Duncan Sur., A-112, pumped 25 bbl., pay 1,103 ft., T.D. 1,135 ft.

Sussex Oil Corp. 31 Mrs. E. A. Glasgow, Lot 34, Bacon subd., dry, T.D. 1,264 ft.

Joy, Clay County: Shell Oil 2 T. H. Brock, Lot 31, Hiram Williams Sur., flowed 616 bbl., pay 5,917 ft., T.D. 6,028 ft.

Seymour, Baylor County: British American 1 J. H. Turbeville "Cowan F," Sec. 205, T.&N.O. Sur., acid, tested salt water, dry, T.D. 2,581 ft.

Burkburnett, Wichita County: Akin and Dimock 6 E. E. Hardin, O. Farrish Sur., A-383, dry, T.D. 1,617 ft.

C. Y. Gorman et al 3 W. L. Doyle, George Wheelwright Sur., A-320, dry, T.D. 1,218 ft.

K.M.A.-Ellenburger, Wichita County: Murchison and Wynne 4-E State Lands, Wichita River bed, flowed 576 bbl., acid, pay 4,252 ft., T.D. 4,284 ft.

Knox, Young County: C. E. Knox 5 Eugenia Taylor A, Sec. 3407, T.E.&L. Sur., flowed 100 bbl. oil and 25 bbl. water day, acid, pay 4,085 ft., T.D. 4,135 ft.

WEST CENTRAL TEXAS COMPLETIONS

Wildcats

Callahan County: A. C. More 1 C. B. Snyder, Sec. 144, B.B.B.&C. Sur., location abandoned.

Fields

Hamby, Shackelford County: Sabens and Pinkston 2 F. W. Shotwell B, Sec. 59, Blk. 14, T.&P. Sur., location abandoned.

Rocky Mountain Area

(Continued from Page 60)

a test in the Moorcroft district, Crook County, northeastern corner of Wyoming, in its 1 Coltharpe, C SE NW 18-51n-66w. Contract has been let to Manning & Martin, Inc., and it will be drilled with rotary to test all horizons down to 3,000 ft. It is located on the extreme west edge of the Black Hills uplift. There are numerous oil springs in the area and as far back as 1888 oil was shipped to the Black Hills mining district for lubrication purposes at a price of $28 a barrel. Probable 60 wells have been drilled in the area ranging from 400 to 1,650 ft., most of which were failures, but some pumped as high as 5 bbl. a day. No deep test has been made. The Upper Cretaceous outcrops at numerous places in the district.

The Texas Co., following the purchase of the Illinois Pipe Line Co. gathering system in the Kevin-Sunburst field, is taking 100 per cent of capacity from wells connected with that system and its own connections. The company has a refinery at Sunburst. Montana's allotted quota for November is 24,800 bbl. daily against 24,400 in October and 22,800 in September. The increase is to take care of additional demands from the northwest.

MONTANA COMPLETIONS

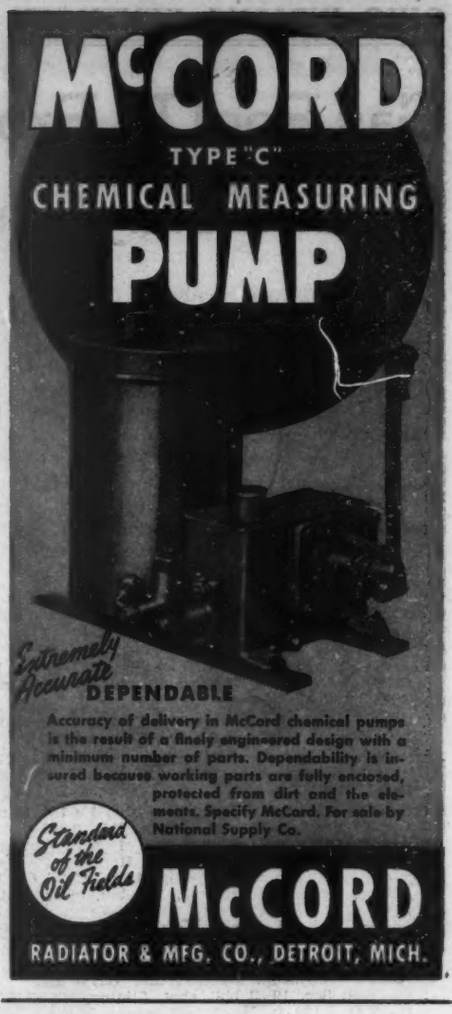
Cut Bank, Glacier County: Glacier Production Co. 5 Scheuren, CNL SE SW 20-33n-5w, T.D. 3,030 ft., 7-in. 2,994 ft., Cut Bank sand 2,992-3,027 ft., main pay 3,015-27 ft., swabbed 27 bbl. in 16 hr., shot with 60 qt., cleaning out and testing.

Santa Rita Oil & Gas Co. 1 Vale, C SW SE 30-34n-5w, T.D. 2,815 ft., 7-in. 2,778 ft., Cut Bank 2,775-2,805 ft., main pay 2,785-2,805 ft., 700 ft. fluid in hole, swabbed 70 bbl. first 24 hr., shot with 60 qt.

Santa Rita Oil & Gas Co. 3 Jacobson, C NE SW 23-37n-5w, T.D. 2,616 ft., 7-in. 2,605 ft., Sunburst sand 2,555-75 ft. dry, Cut Bank 2,580-2,616 ft., still in sand, main pay 2,595-2,616 ft., swabbed 200 bbl. first 24 hr.

A. E. Crumley 3 Weaver, NW SE Lot 7, 27-35n-6w, T.D. 2,923 ft., 7-in. 2,872 ft., Cut Bank 2,860-2,918 ft., main pay 2,900-18 ft., swabbed 140 bbl. first 24 hr., preparing to shoot.

Kevin-Sunburst field, Toole County: J. H. Agen Oil 21 Goedderts, SE SE NW 23-35n-3w, T.D. 1,713 ft., contact 1,708-13 ft., swabbed 6 bbl., natural, will acidize.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OHIO, INDIANA, KENTUCKY

Gas Pool In Prospect Two Miles East of Clayton Oil Pool

ZANESVILLE, Ohio.—Prospects of a fair gas pool 2 miles east of the Clayton oil pool were increased by the completion of a 2,000,000-cu. ft. gasser in the Clinton sand. The Industrial Gas Corp. 1 A. M. Downey, NW SW Section 1, had the sand at 3,446-55 ft., drilling was stopped at 3,455 ft. The rock pressure was 1,115 lb.

The Berea gas pool in Orange Township, Meigs County, was extended ¼ mile southward by a fair gas well. H. B. Walker 2 G. Griffin, gaged 2,380,000 cu. ft. in the Berea after drilling only 5 ft. in the sand. Top of Berea was 1,633 ft.

OHIO COMPLETIONS

Athens County, Carthage Township: H. B. Walker 1 E. Taylor, Sec. 32, 250,000 cu. ft. gas, Berea, T.D. 1,739 ft.

Coshocton County, Tiverton Township: Ohio Fuel 1 Clarence Holt, Sec. 7, show oil, plugged, Clinton, T.D. 3,333 ft.

Cuyahoga County, Dover Township: East Ohio Gas Co. 1 Oreng and May, Lot 23, dry, Clinton 2,563 ft.

Guernsey County, Adams Township: Roy Early 1 S. Tucker, Sec. 22, show oil and gas, shot, plugged, Berea, T.D. 1,199 ft.

Holmes County, Monroe Township: Ohio Fuel 1 Harvey Martin, Sec. 15, dry, Clinton, T.D. 3,375 ft.
Washington Township: Ohio Fuel 1 Alva Young, Sec. 16, dry, Clinton, T.D. 3,090 ft.

Jefferson County, Saline Township: J. E. M. Oil Co. 1 Iddings heirs, NW Sec. 13, 1½ bbl. after shot, Berea, T.D. 710 ft.

Licking County, Eden Township: Lacknette et al 1 S. Oatman, Sec. 24, 250,000 cu. ft. gas, shot, Clinton, T.D. 2,655 ft.
Hopewell Township: Hazelett and Davis 1 F. P. Claggett, Sec. 19, 3 bbl., shot, Clinton 3,085-3,120 ft., T.D. 3,146 ft.; (corrected report formerly reported as dry hole, October 22, 1942).

Medina County, Granger Township: Ohio Fuel 1 Dave Gabor, Lot 63, 970,000 cu. ft. gas, Clinton, T.D. 3,537 ft.

Meigs County, Bedford Township: Ohio Fuel 1 Mildred Douglas, Sec. 4, 100,000 cu. ft. gas, Maxon, T.D. 1,210 ft.
Orange Township: H. B. Walker 2 G. Griffin, Sec. 36, 2,380,000 cu. ft. gas, Berea 1,633-38 ft.

Perry County, Bearfield Township: Ohio Fuel 2 Lola Coulter, Sec. 34, dry, Clinton 3,895-3,927 ft., Medina 3,992-4,003 ft., some water, T.D. 4,004 ft.
Clayton Township: Industrial Gas Corp. 2 M. Hough, Sec. 1, 2,000,000 cu. ft. gas, Clinton 3,198-3,231 ft.
Preston Oil Co. 4 Joseph A. Wilson, SW Sec. 6, dry, through Medina, T.D. 3,287 ft.
Monroe Township: Hermey Bros. 27 David C. Hermey, SW Sec. 27, 10 bbl., Berea, T.D. 1,095 ft.
Reading Township: Pure Oil Co. 2 J. Ford and E. O. Brown, SE Sec. 1, 41 bbl. and 25,000 cu. ft. gas, Clinton sand, T.D. 3,250 ft.

Vinton County, Vinton Township: Mathews Oil Co. 1 J. R. Thompson, Sec. 6, dry, first Berea, T.D. 1,056 ft.

Washington County, Aurelius Township: G. F. Warren 2 fee, NE Sec. 17, dry, stray sand, T.D. 582 ft.
Barlow Township: Dolph Anderson et al 1 Greenlees heirs, Lot 312, 500,000 cu. ft. gas, Injun sand, T.D. 1,380 ft.
Fairfield Township: Ohio Fuel 1 E. T. Goff, Sec. 33, dry, Berea, T.D. 1,902 ft.

EASTERN KENTUCKY

ASHLAND, Ky.—For the first time this year no completions were reported during the week although eastern Kentucky operations continued to show some slight improvement. Four new locations were reported in one area and one in a second field.

A check of the weekly drilling reports shows several wells are at the completion point and one operation has a test oil report, and a second testing gas.

During the first weeks of the federal spacing regulations only slight information was available on drilling in this part of the state. A majority of the wells completed during that period were reported regularly and then released as the clarification of the spacing order led to a definite understanding in this area.

However, a study of the reports reveals that while there have been some weeks when only one well was completed in eastern Kentucky, this is the first during 1942 when a report of a completion was not received here.

INDIANA

EVANSVILLE, Ind.—Activity in the new Vernon Heights pool, 2 miles southwest of Evansville, continues to increase and at present the pool is the most active in the state. Sells Petroleum, Inc., 3-A J. A. McCarty unit, NW NE NW 32-6s-11w, has set casing to test the Waltersburg sand at 1,772-83 ft. in the pool and the same operators are drilling at about 1,100 ft. on the 1 Schutte-Webber communitized, SE SE SW 29-6s-11w. In addition, George Nelson and the United Oil Co. have two operations under way in the pool and Mohawk Drilling has location staked for a test which is to begin soon. The development in the pool is following a northeast trend and the wells in the area have been completed for initial productions of from 50 to 100 bbl. of oil daily on pump. All production has been from the Waltersburg sand.

In Owen County the Sun Oil Co. is taking a core in the Trenton lime at 2,399 ft. in their wildcat, the 1 G. E. Chambers, E½ SW SE 23-10n-5w, about 8 miles west of Spencer.

F. B. Hillis et al have abandoned the 1 B. F. Hayes in Donation 96-1n-10w, Gibson County, at a total depth of 1,811 ft. No shows of oil were reported in the well. The Carroll Oil Co. is making a production test on the 2 Hi Crecelius, NW NW SE 36-1s-10w, 5 miles northeast of Princeton. The well at last reports was flowing at the rate of 35 bbl. of oil a day, and was being put on pump for further test.

INDIANA COMPLETIONS

Gibson County: B. Fields "A" Garrett & Hall, NW SW SW 31-2s-12w, dry, T.D. 1,105 ft., sand 1,095 ft.

OKLAHOMA FIELD REPORT

Shallow Prue Sand Discovery Reported in Pawnee County

By CARL HOOT

ANOTHER shallow sand discovery for Oklahoma was reported last week. About 8 miles east of Pawnee, in Pawnee County, E. W. Whitney 1 Arnold, SW SE 26-22n-6e, pumped 35 bbl. of 37-gravity oil a day from Prue sand at 2,648-85 ft. The well was shot at 2,652-84 ft. and total depth was 2,695 ft. Township 22n has had a number of dry holes drilled to the Wilcox at an average depth of around 3,500 ft., all of which were northwest of the 1 Arnold. In 1926 and 1927 Devonian Oil Co. drilled six wells in Section 35, ½ mile south of the discovery, four of which produced a small amount of oil from a sand at 2,670-85 ft.

Lloyd Noble's 1-A Joliff, Springer sand discovery in Carter County, was completed last week for 240 bbl. of 39-gravity oil a day, flowing through ⅛-in. choke on tubing. Location of the well is some 6 miles south of Ardmore.

Cromwell Zone Extended

Four miles west and north of the Cromwell pool, Shell Oil Co., Inc., 1 Factor, NE NE SW 25-11n-7e, pumped and flowed 76 bbl. of oil a day from Cromwell sand at 3,654 ft. Location is 3 miles north and slightly east of Hall 1 Lindsay, NW SW NW 11-10n-7e, completed in August for 66 bbl. of oil a day from Cromwell sand at 3,602-22 ft.; a 4-mile west extension to the Cromwell pool.

Alma Oil Co. added two big wells to its East Watchorn pool, which now has 10 producers. On the western edge of the field 1 Grant, SW NE 26-23n-3e, flowed 226 bbl. of oil in 2 hours from Wilcox at 4,011-20 ft. and at the southern tip of the field the 2 Robedeaux, SW SE SE Section 26, found the sand at 3,941-53 ft. and flowed 93 bbl. of oil an hour.

OKLAHOMA COMPLETIONS

Wildcats

Carter County: Lloyd Noble 1-A Joliff, NE NW NW 24-5s-1e, flowed 240 bbl., Springer sand 3,079-3,302 ft., discovery.

Comanche County: Texas 1 Thomas, NW NE SE 20-4n-10w, dry, T.D. 4,368 ft., Pennsylvanian 2,839 ft., broken sand 3,132 ft.

Jefferson County: H. F. Gibson et al 1 Johnson, SE SE NW 29-3s-4w, dry, T.D. 2,750 ft., sand 1,873 ft., Arbuckle conglomerate 2,879 ft.

Logan County, 3 mi. SE of Guthrie pool: Eason Oil 1 McDonald, NE NE NW 15-17n-1w, dry, T.D. 5,248 ft., Bartlesville 4,835 ft., Hunton 5,008 ft., Viola 5,119 ft., Wilcox 5,210 ft.

Pawnee County: E. W. Whitney 1 Arnold, SW SE 26-22n-6e, pumped 35 bbl., Prue sand 2,648-85 ft., T.D. 2,695 ft.
Las Tecas 1 Baker, NE SW SE 9-20n-5e, dry, T.D. 3,995 ft., Bartlesville 3,456 ft., Viola 3,846 ft., Wilcox 3,877 ft.

Fields

Bixby, Tulsa County: Theodore Santer 1 Black, NW cor. 5-17n-13e, flowed 71 bbl., sand 1,908-15 ft.

Bristow, North, Creek County: Zephyr Drlg. 2-A Sinclair, SW NE NW 34-17n-8e, pumped 50 bbl., Prue sand 2,396-2,434 ft., T.D. 2,440 ft.

Cromwell, Seminole County: Shell 1 Montgomery, NW cor. 11-10n-7e, pumped 30 bbl., Cromwell sand 3,593 ft., T.D. 3,604 ft.

Edmond, Northeast, Oklahoma County: Pure 3 Beoquist, SW NE SE 30-14n-3w, dry, T.D. 6,730 ft., sand 6,257 ft., second Wilcox 6,712 ft.

Olympic, Okfuskee County: C. W. Titus 1 Palmer, NE NW NW 23-10n-8e, dry, T.D. 3,555 ft., Bartlesville 2,745 ft.

Pauls Valley, Garvin County: Texas-Ohio 1 Patchell, NE SE 25-4n-1w, flowed 673 bbl., Wilcox 4,045-94 ft.

Velma, Stephens County: Skelly 28 Wirt Franklin, SE NW SE 35-1s-5w, pumped 12 bbl., sand 631-732 ft.

Watchorn, East, Pawnee County: Alma Oil 1 Grant, SW NE 26-23n-3e, flowed 226 bbl. in 2 hr., Wilcox 4,011-20 ft.

Miscellaneous

Creek County: Sinclair Prairie 45 Berryhill, E½ NW SE 16-17n-12e, pumped 3 bbl., sand 1,15-1,586 ft., T.D. 1,590 ft.

Noble County: G. C. English, NE SW SE 14-24-1w, dry, T.D. 2,290 ft., sand 1,852 ft.

Okmulgee County: M. W. Lee 1 Bean, NE NE NW 14-12n-12e, dry, T.D. 2,253 ft., sand 2,218 ft.

Osage County: W. M. Dunn 1, SW NE NW 31-24n-11e, dry, T.D. 1,967 ft.
Oklahoma Power et al 142, NW SE SW 30-22n-9e, pumped 25 bbl., sand 436-52 ft.

Pawnee County: Mapr Oil 1-A Boker, N½ NE NW 9-

20n-8e, pumped 20 bbl., sand 2,450-80 ft., T.D. 2,495 ft.

Seminole County: Shell 1 Factor, NE NE SW 25-11n-7e, pumped and flowed 76 bbl., Cromwell 3,654 ft., T.D. 3,676 ft.

TEXAS GULF COAST

Tests Under Way in Several Prospective Discoveries

By T. F. SMILEY

HOUSTON, Tex.—Wildcats in Austin and Montgomery counties and an outpost extending the Fig Ridge field in Chambers County were centers of interest in the upper coastal district. Grey & Wolfe 1 Grogan-Cochran Lumber Co., A. Prather Survey A-427, 3 miles southeast of Magnolia in Montgomery County and west of the Lake Creek field, reached a total depth of 11,921 ft. when casing was set at 10,134 ft. It is credited with having enough shows in higher sands to make a new oil or distillate field, but is being drilled deeper.

Ohio Oil Co. 1 Roy Kaeschele, V. Flores Survey, 3 miles south of Orange Hill in Austin County, made 39 bbl. of oil and 18 bbl. of water through 14/64-in. choke at 9,297-9,310 ft. Tubing pressure of 2,900 lb. dropped to 1,025 on enlarging the choke to ½ in. The perforations were squeezed and the well is being drilled deeper.

The Fig Ridge field of Chambers County was extended to the northwest by Sun 1 Dornbos. After making 720 bbl., mostly water through perforations at 8,214-30 ft., the water was plugged off and a test at 8,214-25 ft. yielded 79 bbl. in 14 hours.

In Jackson County, the North La Ward field was extended to the northwest and north. A new sand is being tested on the west flank of the Mayo field at 6,150-60 ft. and the ¾-mile gap between Mayo and Ganado is being tested by Texas 7 Tunison which has spudded.

E. O. Ehlinger 1 Gibb Brothers, John Fox Survey, 7 miles south of Huntsville, Walker County, entered the Ceratobulimina zone at 4,230 ft. and is drilling ahead to the Wilcox.

TEXAS GULF COAST COMPLETIONS

Fields

Mercy, San Jacinto County: Shell 2 Central Gas & Coke, 168 bbl. through ⅛-in. choke, T.P. 1,100 lb., gas-oil ratio 1,100, T.D. 8,280 ft.

Navidad, Jackson County: W. S. Boyle 1 J. Whitley, F. G. Keller Sur., dry at 5,010 ft., P.B. to 4,170 ft. W. S. Boyle and J. G. Mayo 1 R. Terrell, William Murphy Sur., dry at 6,025 ft., P.B. to 3,980 ft., O.W.W.O.

Texana, Jackson County: Moore & Ahern 1-B Clements, S. F. Austin Sur., A-5, 1,300,000 cu. ft. gas with 8 bbl. distillate, T.P. 2,200 lb., C.P. 2,225 lb., S.I. pressure 2,250 lb., T.D. 6,765 ft., P.B. to 5,618 ft., O.W.P.B.

Buttermilk Slough, Matagorda County: Sun 1 M. O. Cavallin, John Duncan Sur., dry at 9,582 ft., P.B. to 7,886 ft., O.W.W.O.

North La Ward, Jackson County: Glenovia Oil Co. 4 Olsorsky, I.&G.N. Sur., Sec. 2, A-132, 77 bbl. through 7/64-in. choke, T.P. 250 lb., C.P. 950 lb., gas-oil ratio 109, 5,207-28 ft., T.D. 5,683 ft. Hewitt & Daugherty 2 W. C. Owens, P. Scott Sur., A-69, 291 bbl through ¼-in. choke, T.P. 675 lb., C.P. 725 lb., gas-oil ratio 200:1, pay 5,587-92 ft., T.D. 5,673 ft.

Stewart, Jackson County: Texas F. Gruberg, 104 bbl. oil and 3 bbl. salt water through 10/64-in. choke, T.P. 150 lb., C.P. 550 lb., gas-oil ratio 275, T.D. 5,007 ft.

West Mauritz, Jackson County: J. B. Coffee et al 2-B T. W. Maurtiz, M. C. York Sur., A-312, 132 bbl. through 7/64-in. choke, T.P. 720 lb., C.P. 890 lb., gas-oil ratio 560, pay 5,467-72 ft., T.D. 5,810 ft.

Stowell, Jefferson County: Glen H. McCarthy 2 B. R. Prox, B. A. Vacocu Sur., A-53, dry at 9,890 ft.

Orange, Orange County: Kilmarak Oil Co. 1 Federal Royalty Co., William Dyson Sur., 53 bbl. through 3/32-in. choke, T.P. 900 lb., C.P. 800 lb., gas-oil ratio 100, T.D. 4,774 ft.

Alta Loma, Chambers County: Stanolind 7 John A. Huhn, 187 bbl. through ⅛-in. choke, T.P. 1,000 lb., gas-oil ratio 835, T.D. 9,181 ft.

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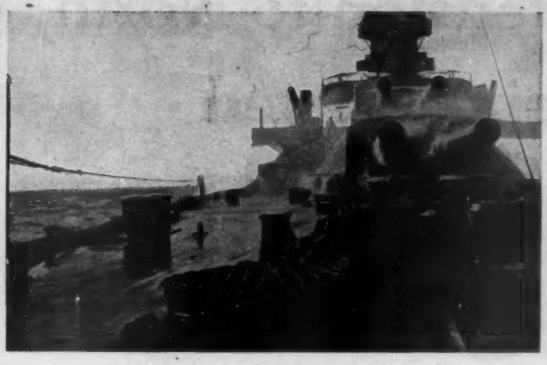

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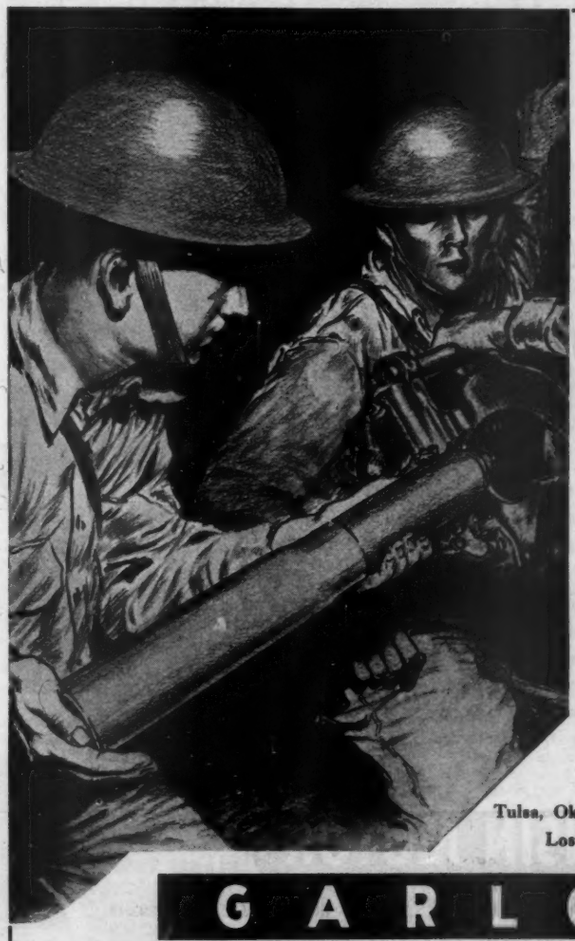

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SOUTHWEST TEXAS

Probable Extension to North Sun Field Being Tested

CORPUS CHRISTI, Tex.—The North Sun field has probably been extended another 2/5 mile north by Sun 2 Olivares, which was drilled to 4,555 ft. Sand was logged at 4,547-55 ft., and a production test is being made through perforations.

The Wilcox trend continues active with wildcats started in De Witt, Gonzales, and La Salle counties. In De Witt County, Adams 1 Piper, H. G. Wood Survey, is in line with production in Colorado and Lavaca counties to the northeast, the Tide Water discovery in southern De Witt County and northern Bee County. It is the second test for the Yorktown district, being about 1 mile northeast of the discovery well. In northeastern Gonzales County, 6 miles south of Luling, W. S. Boyle 1 Ottine Oil Co. has been staked in the Samuel Robbins Survey. Four miles west of the Washburn field in La Salle County, L. V. Manry has made location for 1 Talbert.

In Duval County, 3 miles west of the Kohler field, Ogden & Voyles pumped 7½ bbl. of oil and 17½ bbl. of water in 7 hours from 5 ft. of Cole sand, topped at 1,780 ft. The well, 1 Richardson, C.B.&C.N.G.R.R. Sur. 3, A-668, was originally drilled to 2,957 ft. into a water sand and was plugged back to test the Cole sand.

Further tests on Sun 1-D T. T. East, Santo Domingo de Arribe grant, 8 miles east of the Colorado field made 10 bbl. through ⅛-in. choke with tubing pressure of 1,000 lb., casing pressure 1,100 lb. and gas-oil ratio of 86,748 to 1 at 4,745-51 ft. Previously the well had made 14 bbl. with 10 bbl. of salt water and a gas-oil ratio of 49,800 to 1. On the west side of the Colorado field, 2 miles from the edge, material is being moved in for Zachary 1 Evans in the James J. O'Conner Survey.

Location has been made for a 10,000-ft. test in Live Oak County in the James L. Vaughn Survey, 8 miles west of George West.

Two wildcats are showing discouraging results to date in the lower Gulf Coast sector. In Goliad County, Ginther, Warren & Ginther are reported to have tested salt water in 1 Wood, D. Morris Survey at 5,031-42 ft. and perforated 5½-in. casing set at 4,215 ft. to test a sand which is showing gas on ¼-in. choke at 4,170-80 ft. Tubing pressure is 1,600 lb. and casing pressure 1,700 lb. The Cadena outpost, Taylor 1 G. Garcia, 1,750 ft. west of the discovery, was perforated at 6,350-55 ft. and after test squeezed and reperforated at 6,325-30 ft., where it was swabbing salt water.

Five wells, both field and wildcat were staked in the lower Gulf sector, two in the south central district and four in South Texas. Most of these were development wells and wildcatting activity is very low.

LOWER GULF COAST COMPLETIONS

Wildcats

Hidalgo County: Continental and Sun 1 J. J. Young, dry at 10,201 ft.

Bee County: Stanolind 1 M. S. Gould, W. C. McGill Sur., 7 mi. NW of Burnell, dry at 9,500 ft.

Nueces County: Osborn, Fleet, and Mid-Continent 1 Thomas Dix, V. L. De Herren Sur., Wright tract, 3 mi. NE of Banquete, dry at 7,056 ft.

Fields

Ben Bolt, Jim Wells County: Bridwell Oil Co. 1 N. A. Hoffman, La Trinidad grant, sulfur odor at 4,637-46 ft., dry at 5,565 ft.

South Caesar, Bee County: Continental 2 M. T. Fox, 90 bbl. through ⅛-in. choke, T.P. 730 lb., C.P. 750 lb., gas-oil ratio 438, T.D. 6,583 ft.

Jay Simmons et al 2 Ulse Cotton, 301 bbl. through ⅛-in. choke, 860 lb., C.P. 1,100 lb., gas-oil ratio 467, T.D. 6,628 ft.

Seeligson, Jim Wells County: Magnolia 14 A. A. Seeligson, 87 bbl. through 7/64-in. choke, T.P. 450 lb., C.P. 1,000 lb., gas-oil ratio 430, T.D. 6,802 ft.

Seeligson, Kleberg County: Humble 6 King ranch-Cabeza, 168 bbl. through ⅛-in. choke, T.P. 1,120 lb., C.P. sealed, gas-oil ratio 703, T.D. 6,098 ft.

Clara Driscoll, Nueces County: Texas 4 H. E. Flynn, tested dry gas on perf. 5,259-65 ft., squeezed and perf. 5,265-68 ft., 62 bbl. through ⅛-in. choke, T.P. 530 lb., C.P. 1,350 lb., gas-oil ratio 1,930, T.D. 5,404 ft.

Odem, San Patricio County: Seaboard 1 R. L. Anthony, oil shows at 6,736-39 ft. and 6,808-15 ft., dry at 6,826 ft.

Seaboard 2 Laura A. Compton, 66 bbl. through ⅛-in. choke at 5,795 ft., T.P. 1,325 lb., C.P. 1,775 lb., gas-oil ratio 4,227, T.D. 5,795 ft.

Stratton, Jim Wells County: Humble 3 King ranch-Arroyo, 88,000,000 cu. ft. gas, open flow, S.I. pressure 2,705 lb., T.D. 6,749 ft.

SOUTH TEXAS COMPLETIONS

Wildcats

McMullen County: J. W. Gorman 1 Mrs. Ellen Atkinson, oil odor at 2,561-64 ft., gas odor at 2,578-80 ft., oil odor at 2,597-99 ft. and 2,022-31 ft., dry at 2,765 ft.

Starr County: A. E. Henniger 1 Gonzales et al, dry at 822 ft.

Fields

Casa Blanca, Duval County: M. S. Massingill 20 D. C. R. C., Sur. 293, pumped 36 bbl. at 1,021-37 ft.

Driscoll, Duval County: Continental 75-A Clara Driscoll, perf. 3,360-75 ft., 361 bbl. through ¼-in. choke, T.P. 440 lb., C.P. 1,040 lb., gas-oil ratio 367, T.D. 3,390 ft.

Colorado, Jim Hogg County: Humble 1-D T. T. East, Los Moritos grant, 88 bbl. through ⅛-in. choke, T.P. 100 lb., C.P. 600 lb., gas-oil ratio 150, T.D. 3,195 ft.

Boyle, Starr County: Fidelity Oil & Royalty Co. 1-B Sugar Land Industries, slight gas and oil show, no pressure, dry at 4,302 ft.

Rincon County: Continental and Davis 5-D Slick estate, perf. at 3,985-91 ft., 151 bbl. through ⅛-in. choke, T.P. 380 lb., C.P. 920 lb., gas-oil ratio 414, T.D. 4,030 ft.

Glen, Zapata County: M. S. Jeffries 2 Robert Hinnant, slight gas odor at 3,232-40 ft., dry at 3,248 ft.

SOUTH CENTRAL TEXAS

Wildcats

Frio County: Wiegand Bros. 1 T. J. Gilliam, B.S.&F. Sur., Sec. 1, ½ mi. W of Pearsall, dry at 5,989 ft.

Milam County: Rosner & Blankenstein 1 J. W. Garner S. C. Robertson Sur., dry in Navarro at 650 ft.

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LOUISIANA GULF COAST

Prospective Pool Openers In Southern Vermilion Parish

By T. F. SMILEY

NEW ORLEANS, La.—With two prospective pool openers, southern Vermilion Parish was the most interesting area on the Louisiana coast last week. Union Oil Co. 1-C Louisiana Furs, in 1-16s-2e, made a test at 11,582-86 ft. making gas and an estimated barrel of distillate an hour. Working pressure was 4,075 lb. The company is plugging back to test one of two higher sands which are reported to be better than the one already tested. Total depth was 11,985 ft. Humble 1 Louisiana Land and Furs, 24-16s-1e, Pecan Island prospect set casing at 11,449 ft. Several good sands carrying gas and possibly oil were reported above this depth but the operators are drilling ahead below 11,550 ft.

Fire which had been burning more than 2 weeks at Union Sulphur 1 Gueno, 51-8s-2e, Acadia Parish, was extinguished and workmen were digging ditch and preparing to cap the well, which was blowing dry gas.

LOUISIANA GULF COAST COMPLETIONS

Wildcats

St. Landry Parish: Stanolind 1 W. D. Haas, 17-4s-6e, dry at 10,852 ft.

Fields

Jennings, Acadia Parish: D. D. Feldman et al 3 Truschell, 42-9s-2w, deepened from 6,962-7,235 ft., O.W.D.D.

Pine Prairie, Evangeline Parish: E. J. Nicklos et al 3 Jessie Reed, 36-3s-1w, 288 bbl. through 5/32-in. choke, T.P. 1,500 lb., C.P. 600 lb., gas-oil ratio 1,290 at 7,586-98 ft., T.D. 7,631 ft.

Ville Platte, Evangeline Parish: Continental 2 Evangeline Securities Co. 1, 4-4s-2e, 180 bbl. through 12/64-in. choke, T.P. 800 lb., C.P. 1,700 lb., gas-oil ratio 3,988 at 10,126-72 ft.

Continental 8 J. E. Vidine, Tract 2, 34-3s-2e, 137 bbl. through 14/64-in. choke at 10,172 ft., T.D. 10,230 ft.

The drill stem was stuck in gypsum at 1,490 ft. in Gulf 1 Delta Securities, 1-19-30e, La Fourche Parish. This well had previously encountered

trouble by losing returns in cavernous cap rock. It was reported that Union Sulphur might abandon Homer Herbert, 18-12s-8w, in Cameron Parish. With a total depth of 9,744 ft., the hole has been plugged back to 2,500 ft. to sidetrack but is waiting on orders.

Stanolind 1 W. D. Haas, 17-4s-6e, in St. Landry Parish, was dry at 10,852 ft. This test found the Heterostegina zone at 5,268 ft., Vicksburg 8,006 ft., Jackson 8,463 ft., Moody's Branch 8,615 ft., Eponides Yegua 8,767 ft., Cook Mountain 9,160 ft., Sparta 9,549 ft., Cane River 9,823 ft., and Wilcox at 10,430 ft.

Permian Basin-Panhandle

(Continued from Page 61)

Permian 4,870 ft., top Simpson 4,897 ft., top Ellenburger 5,465 ft., T.D. 5,743 ft. lime, P.B. to 5,504 ft., used 13,500 gal. acid, swabbed small show oil and brackish water, dry.

Crockett County: Moore Bros. and Olson Drilling Co. 6-A Halff estate, 4 mi. NW Sheffield, elev. 2,278 ft., dry, T.D. 1,812 ft.

Dawson County: Ray Albaugh 1 T. L. Higginbotham, SW SE Sec. 5, Blk. H, E.L.R.R. Sur., N edge county, elev. 3,046 ft., tops: anhydrite 2,160 ft., salt 2,190 ft., solid lime 4,230 ft., dry, T.D. 5,204 ft.

Fields

Slaughter, Cochran County: Texas Pacific Coal & Oil Co. 4 Tarver, NW NW Lab. 15, Lge. 55, Oldham C.S.L. Sur., elev. 3,702 ft., pay 5,000 ft., flowed 552 bbl. day, acid 10,000 gal., T.D. 5,058 ft.

Cedar Lake, Gaines County: Stanolind 14 American Warehouse Co., NE NE Sec. 5, Blk. H, D.&W. Sur., elev. 3,050 ft., swabbed 607 bbl., pay 4,600 ft., shot 280 qt. nitro, T.D. 4,760 ft.

Slaughter, Hockley County: Honolulu Oil Corp. 19-A Mallet, SW SW Lab. 11, Lge. 52, Scurry C.S.L. Sur., elev. 3,568 ft., flowed 254 bbl., pay 4,970 ft., acid 10,000 gal., P.B. to 4,980 ft., T.D. 5,000 ft.

Honolulu Oil Corp. 26-B Mallet, NE NE Lab. 25, Lge. 48, Edwards C.S.L. Sur., elev. 3,619 ft., flowed 579 bbl., pay 4,940 ft., acid 10,000 gal., T.D. 4,992 ft.

T. F. Morrow 2 Mallet, SE SE Lab. 23, Lge. 48, Edwards C.S.L. Sur., elev. 3,607 ft., flowed 673 bbl., pay 4,940 ft., acid 12,000 gal., T.D. 4,987 ft.

Western States Gas Corp. 15-B Mallet, NW NW Lab 16, Lge. 49, Scurry C.S.L. Sur., elev. 3,605 ft., flowed 701 bbl., pay 4,970 ft., acid 12,500 gal., T.D. 5,034 ft.

Snyder, Howard County: Fleming Oil Co. 4-B Snyder, NW NE Sec. 22, Blk. 30, T.&P. Sur., elev. 2,267 ft., pumped 216 bbl., pay 2,600 ft., 750-qt. shot T.D. 2,894 ft.

Abell, Pecos County: Tal-Vez Oil Co. 1 State-Silverman, 1,650 ft. from E line, 990 ft. from S line, Sec. 10, Blk. 3, H.&T.C. Sur., elev. 2,389 ft., flowed 449 bbl. day through ¼-in. choke, natural, top McKee sand 5,290 ft., pay 5,314 ft., perf. casing 5,316-40 ft., T.D. 5,353 ft.

Keystone-Colby, Winkler County: Parker Drilling Co. 3 Bashara, NW cor. of E 100-ac. of NE¼ Sec. 12, Blk. B-3, P.S.L. Sur., flowed 50 bbl. day through ½-in. choke, gas-oil ratio 5,000:1, pay 3,270 ft., 180-qt. shot, P.B. 3,345 ft., T.D. 3,420 ft.

Emperor, Winkler County: Skelly Oil 53 Halley, NE SW SE Sec. 15, Blk. B-11, P.S.L. Sur., elev. 2,770 ft., flowed 38 bbl. day through ⅛-in. choke, pay 2,753 ft., 300-qt. shot, P.B. to 2,875 ft., T.D. 3,480 ft.

PANHANDLE COMPLETIONS

Carson County: Cities Service 60 Burnett A, Sec. 41, Blk. 5, H.&G.N. Sur., acid 10,000 gal., tested 19,700,000 cu. ft. gas, T.D. 2,550 ft.

Cities Service 7-A Fields, Sec. 13, Blk. 7, H.&G.N. Sur., potential 93 bbl., T.D. 3,220 ft.

Skelly Oil 159 Schafer ranch, Sec. 189, Blk. 3, H.& G.N. Sur., potential 405 bbl., 500-qt. shot, T.D. 3,200 ft.

Skelly Oil 160 Schafer ranch, Sec. 197, Blk. 3, H.& G.N. Sur., potential 505 bbl., pay 3,045 ft., 500-qt. shot, T.D. 3,150 ft.

Potter County: Canadian River Gas Co. 4 Masterson A, dry, T.D. 1,952 ft.

SOUTHEAST NEW MEXICO COMPLETIONS

Maljamar, Lea County: Johnnie Cockburn 6-B Miller, 25-17-32e, flowed 70 bbl. in 2 hr., pay 4,100-4,200 ft., T.D., shot.

Skelly, Lea County: Skelly 4-A King, 33-22-37e, pumped 35 bbl. 3,570-3,704 ft., T.D. 3,716 ft.

Square Lake, Eddy County: Sanders Bros. 10 Evans, 33-16-30e, flowed 75 bbl., pay 2,927-61 ft., T.D., shot 2,875-2,957 ft.

Sanders Bros. 11 Evans, 33-16-30e, flowed 65 bbl., pay 2,926 ft., T.D. 2,960 ft.

Credit for Eastern Kansas Map

The map appearing on Page 23 of the October 22 issue showing the principal secondary-recovery operations in eastern Kansas was furnished by Kansas Blue Print Co., Wichita, Kans. This map illustrated an article entitled, "Secondary Recovery in East Kansas Grows in Importance."

ILLINOIS FIELD REPORT

Dundas Field Well Has Large Production From Levias Lime

MATTOON, Ill.—Illinois operators, having just completed one of the most active weeks of the year, were encouraged by several interesting developments during the past week. Among these were prospective extensions of several pools and the opening of a new pay zone in the Dundas field of Jasper and Richland counties.

Outstanding completion of the week in the eastern part of the Illinois basin was the Gulf Refining Co. 1 Eunice, 335 ft. SL, 1,005 ft. WL SW SE 23-5n-10e, on the extreme eastern side of the Dundas field. No. 1 Eunice produced 1,000 bbl. naturally in 24 hours from the Levias pay where saturation extended from 2,939-47 ft. This is the first Levias well to be completed in the pool, although the Stiff pool, just a few miles east of the Dundas field, produces all its oil from that formation.

Kingwood Oil Co. completed a southern extension of the Bible Grove pool in Clay County at its 1 Addison Lewis, NW NW SW 9-5n-7e, where casing was set to good Cypress saturation at 2,929-42 ft. The discovery well of the Bible Grove pool produced well over 1,000 bbl. of oil daily from the McClosky and for a time oil men predicted that it would be another Johnsonville. However, as offsets to the discovery were drilled and found to be dry, hopes dwindled and the pool remained inactive for several months until it was found to be productive from the Cypress sand. Following this discovery operators began development of the Cypress in the pool on a conservative scale and the Cypress production was extended over a large area. As operators became more confident that the Cypress sand would not play out as the McClosky had done, they began a more rapid development program in the field and at present it ranks as one of the most active fields in the state.

St. Jacob Pool May Be Extended to South

Activity in Madison County's St. Jacob pool increased last week with a southern extension to the pool looming as a possibility and completion of a well within the pool for production equal to the first wells in the area.

The completion was the E. A. Obering 2-A Buchanann, SW NE SE 27-3n-6w. After an acid treatment of 2,000 gallons, the well pumped 600 bbl. of oil from the Trenton in 24 hours. It is an offset to the 1 Buchanann, also a good producer.

A possible southern extension to the pool is the M. D. Bryant 1 Jacob Gross, NE 34-3n-6w. After drilling to a total depth of 2,334 ft., the well was acidized with 2,000 gallons and is now swabbing but without an announced gage. Another Bryant test in the same section, No. 1 Bussong, is drilling below 2,000 ft.

ILLINOIS COMPLETIONS

Wildcats

Clay County: National Pet. 1 Smith, NE SE NW 23-5n-5e, dry at 2,341 ft., Benoist 2,275 ft., Aux Vases 2,332 ft.

Edgar County: F. L. Clapp 1 fee, NW NW NE 34-13n-13w, dry at 859 ft.

Gallatin County: Carter 1 Kinsall, NW NE 21-7s-8e, dry at 2,982 ft., Aux Vases 2,900 ft., Ste. Genevieve 2,974 ft.

Jasper County: Pure 1 Armistead, NE NE 19-6n-10e, dry at 2,892 ft., Weller 2,547 ft., Rosiclare 2,850 ft., Fredonia 2,861 ft.

Marion County: Buell et al 1 Kotva, SW SE NW 36-4n-2e, dry at 2,141 ft., McClosky 2,134 ft.

Richland County: Fred Phillips 1 Eaton, SE SW 26-3n-14w, dry at 3,185 ft., McClosky 3,114 ft.

St. Clair County: P. S. Pritchard 1 Holiday, SE NE NW 31-2n-7w, dry at 2,038 ft., Devonian 1,479 ft., Trenton 1,919 ft.

Saline County: Smokey Oil et al 1 Barger, SE SE 13-10s-5e, dry at 2,558 ft., Ste. Genevieve 2,320 ft., St. Louis 2,548 ft.

Washington County: T. M. Conrey 1 Wisniewski, NE NE SW 12-3s-2w, dry at 1,420 ft., Benoist 1,398 ft.

Wayne County: Cherry & Kidd 1 Seifer, SE NW 1-3s-9e, dry at 3,451 ft., Aux Vases 3,252 ft., McClosky 3,384 ft.

Bell Bros. 1 Allison, NW SE SW 4-2s-9e, dry at 3,376 ft., Aux Vases 3,244 ft., McClosky 3,362 ft.

Fields

Aden, Wayne County: Texas 5 Silverman, NE NW 16-3s-7e, pumped 141 bbl., Aux Vases 3,174-92 ft., T.D. 3,340 ft.

Benton, Franklin County: Shell 5 McKemie, SW SW SW 19-6s-3e, pumped 46 bbl., Tar Springs sand 2,151-77 ft., T.D. 2,177 ft.

E. S. Adkons 2 C. W. & F. Coal Co., NE NW SE 35-6s-2e, pumped 40 bbl., 25-qt. shot 2,131-56 ft., Tar Springs sand 2,137 ft., T.D. 2,157 ft.

Bible Grove, Clay County: Texas 2 Landwehr, NW SW NE 9-5n-7e, pumped 248 bbl., 10-qt. shot 2,529 ft., Weller 2,519-31 ft., T.D. 2,540 ft.

Texas 1 Blaenker, SE SW NE 4-5n-7e, pumped 188 bbl., Cypress 2,484-2,500 ft., T.D. 2,511 ft.

Ohio 2 Foehler, SE SE NW 4-5n-7e, pumped 310 bbl., Cypress sand 2,489-92 ft., T. D. 2,505 ft.

Walter Duncan 1 Veith, NW SW SE 4-5n-7e, dry at 2,940 ft., McClosky 2,905 ft.

Covington, Wayne County: Sohio 1 Hanna, E½ NE NW 31-1s-7e, flowed 1,470 bbl., 2,500 gal. acid, re-acidized 5,000 gal., McClosky 3,212 ft., T.D. 3,225 ft.

Sohio 2 Beck, SE NE 19-1s-7e, flowed 730 bbl. McClosky 3,255-66 ft., 3,267-73 ft., T.D. 3,295 ft.

Epworth, White County: National Pet. 6 McQueen, SE NW SW 32-5s-10e, pumped 26 bbl., Clore 2,080-92 ft., T.D. 2,094 ft.

Geff, Wayne County: Shulte-Wix 1 Atkinson, NE NW SE 11-1s-7e, pumped 131 bbl., Aux Vases 3,086-3,102 ft., T.D. 3,104 ft.

Grayville, White County: Skelly 2-B Fearn, NE SE SW 20-3s-14w, pumped 127 bbl., Biehl 1,881-90 ft., T.D. 1,891 ft.

Inman, Gallatin County: Cherry & Kidd 3 Kerwin, SW NE SW 11-8s-10e, pumped 125 bbl., sand 2,058-61 ft., 20-qt. shot 2,056-66 ft., T.D. 2,068 ft.

Iron, White County: Pure-Carter 1-A Austin, NW SW NW 17-6s-7e, pumped 247 bbl., Paint Creek sand 2,767-99 ft., T.D. 2,830 ft.

Louden, Fayette County: Carter 4-D Fortner, NW SW 27-8n-3e, dry at 3,129 ft., Devonian 3,042 ft.

Carter 3 Rhedemeyer, SE SW NE 3-8n-3e, flowed 180 bbl., Benoist 1,582 ft., T.D. 1,621 ft.

Carter 5 Rhedemeyer, SW NW SE 3-8n-3e, flowed 492 bbl., Weller 1,488 ft., 40-qt. shot 1,494 ft., T.D. 1,620 ft.

Carter 18 Wright, NW NW SE 20-8n-3e, pumped 130 bbl., acidized and shot, Cypress 1,518-30 ft., T.D. 1,530 ft.

Louden, Effingham County: Carter 1 Black, NW SW NW 6-8n-4e, pumped 25 bbl., 10-qt. shot 1,546-59 ft., Weller 1,534 ft., T.D. 1,551 ft.

Maunie, White County: Ralph Holbert 1-A Hubele, SW SW NW 7-6s-11e, dry at 2,232 ft., sand 2,220 ft.

Mount Erie, Wayne County: Pure 2 Shelton, NE SE 35-1n-8e, dry at 3,195 ft., Aux Vases 3,011 ft., Fredonia 3,115 ft.

New Harmony, White County: Cal-Star 24-B Miller-Ford, NE NE SE 21-4s-14w, pumped 144 bbl., 170-qt. shot 2,838-58 ft., Aux Vases 2,837-58 ft., T.D. 2,860 ft.

Noble, Richland County: Pure 33 Coen, SE 4-3n-9e, pumped 267 bbl. oil and 106 bbl. water, Weller 2,590-2,618 ft., T.D. 2,650 ft.

North Boos, Jasper County: Pure 2-A Acklin, NE SW 17-6n-10e, pumped 103 bbl., 5,000-gal. acid, McClosky 2,844 ft., T.D. 2,865 ft.

North Inman, Gallatin County: R. B. Martin 1 Stroud, SE NW SW 15-8s-9e, pumped 142 bbl., Cypress 2,481-95 ft., T.D. 2,517 ft.

Parkersburg, Richland County: C. H. Croft 1 Vaigh, NE SW 17-2n-14w, pumped 192 bbl., McClosky 3,146-60 ft., T.D. 3,163 ft.

Phillipstown, White County: Jarvis & Marcell 2 Cleveland, SE SW SW 36-4s-10e, pumped 71 bbl., 12-qt. shot 2,319-23 ft., T.D. 3,076 ft.

Jarvis & Marcell 1 Cleveland, NW NE NE 1-5s-10e, dry at 2,345 ft., sand 2,320 ft.

Rural Hill, Hamilton County: Texas 2 Dial-Hefner, SW SE SW 7-6s-6e, pumped 3 bbl., Aux Vases 3,114 ft., T.D. 3,122 ft.

St. Jacob, Madison County: Roy Lewis 1 Gansemann, SW SW SE 22-3n-6w, pumped 60 bbl., Trenton 2,372 ft., T.D. 2,395 ft.

Bryant et al 2-A Buchmann, SW NE SE 27-3n-6w,

(Continued on Page 71)

NORTH LOUISIANA, ARKANSAS

Wildcats Active in New London Area

SHREVEPORT, La. — Completions in proven areas in the North Louisiana-Arkansas area have been down over the past week or so but attention was focused on a number of wildcat tests. In Union County, north of the New London pool, Union Sawmill 1 Frost, SW NW 1-18s-12e, had the drill pipe stuck in dry Smackover lime at 5,700 ft. Just south of New London C. H. Lyons 1 Gerton, SW SW 12-18s-12e, developed water in lime at 6,100 ft. Operators have set water retainer and will test upper formations. No information other than the drilling report was available on Bruce Anthony's wildcat, 1 Giles in 26-16s-14e, which was below 2,800 ft. Skelly Oil Co. 1 Calion Lumber Co. in 28-15-14e was drilling below 4,900 ft., and E. L. Hunt 1 Lurlow-Abbott in 27-14-14e, was down 3,800 ft.

LOUISIANA COMPLETIONS

Wildcats

Bossier Parish, 3 mi. W of Bellevue: Phillips Pet. 1 Kendrick, NE NE SW 22-19n-11w, dry, T.D. 9,070 ft.
Hunt Oil 1 Bilbray, SW SE 5-23n-11w, dry, T.D. 6,485 ft
Catahoula Parish: Continental 1 Jones, SE SE SE 35-10n-8e, dry, T.D. 6,003 ft.
N. H. Wheless 1-C Louisiana Delta, NE NW 1-6n-5e, dry, T.D. 6,314 ft.
Claiborne Parish: F. R. Sylvestre 1 fee-McElwee, SE SE 11-22n-7w, dry, T.D. 6,005 ft.
Tensas Parish: Lastecas Pet. Co. 1 Wetherly, NE NE 38-12n-12e, dry, T.D. 6,113 ft.

Fields

Caddo, Caddo Parish: Bering Oil 2 Hurdle, SW NE SE 34-22n-16w, dry, T.D. 2,494 ft.
Haynesville, Claiborne Parish: F. R. Sylvestre 1 Winn, NE SE 26-23n-8w, flowed 268 bbl., Pettit 5,468-75 ft., 5,524-35 ft., T.D. 5,550 ft.
Little Creek, La Salle Parish: O'Meara Bros. 5 Tremont, NW NW 24-9n-1e, 1,500,000 cu. ft. gas, sand 2,452-56 ft., T.D. 2,600 ft.
Monroe, Morehouse Parish: Southern Carbon 42 Tensas, C N½ NW 11-21n-4e, 1,214,000 cu. ft. gas, pay 2,200-2,139 ft., T.D. 2,200 ft.
Monroe, Union Parish: Interstate Natural Gas 121 fee, C W½ 18-21n-4e, 15,617,000 cu. ft. gas, pay 2,082-2,152 ft., T.D.
Shreveport, Caddo Parish: J. M. Harper 2 Waller, NW NE NW 25-18n-14w, pumped 32 bbl., pay 5,562-66 ft., T.D. 5,569 ft.
Tensas Parish: E. C. Johnson 1 Brown, 4-9n-10e, 26,000,000 cu. ft. gas, pay 2,131-39 ft., T.D. 5,010 ft.
California Co. 4 Applegate, 14-9n-10e, flowed 120 bbl., pay 3,925-30 ft., T.D. 4,680 ft.

ARKANSAS COMPLETIONS

Wildcat, Ouachita County: J. F. Magale et al 1 Parker, NE SW 17-13s-16w, dry, T.D. 3,601 ft., Buckner 3,105 ft., Smackover 3,240 ft.
Dorcheat, Columbia County: Arkansas Fuel Oil 1 Barton, NW NE 14-18s-22w, flowed 73 bbl. of condensate, Smackover 8,840-70 ft., old well worked over.
Midway, Lafayette County: Barnsdall Oil 3 Powell, NE NW 10-15s-24w, flowed 146 bbl., Smackover 6,487-6,505 ft.
Arkansas Fuel Oil 2 Turner, approx. C SE SW 12-15s-24w, flowed 260

(Continued on Page 83)

CANADIAN FIELDS

Complete Large Producer Southwest Turner Valley

By VICTOR LAURISTON

CHATHAM, Ont.—Crude and natural-gasoline production from all Alberta fields for the week ending October 19 averaged 26,952 bbl. daily compared with 27,179 bbl. daily for the previous week and 27,765 bbl. daily for the corresponding week last year. The daily average included 25,818 bbl. of crude and 669 bbl. of natural gasoline from Turner Valley and 465 bbl. of crude from outside fields. There were 230 producing wells, 26 drilling, 1 finished, 5 testing, 3 suspended, 9 standing, 7 abandoned, and 2 new wells spudded.

Large Producer in South

In the southwest Turner Valley extension, Northwest-Hudson's Bay 8, LSD 2-3, 8-18-2w5, finished at 8,645 ft. with Madison lime at 8,214 ft., was acidized with 3,500 gal. in the upper and 2,500 gal. in the lower porous and started flowing at 50 to 60 bbl. an hour. Settled production is expected to make the well the largest producer in the south end of the field. It extends the producing area ¼ mile south of Northwest-Hudson's Bay 6, also a large well, and is likely to bring about resumption of drilling on the Brown Corp. well, ¼ mile southwest and standing at 3,040 ft., and Theo Grewer No. 1, ¼ mile southeast, standing at 1,203 ft. Northwest-Hudson's Bay 12, LSD 8, 8-18-2w5, offsetting the new producer to the northeast, has spudded and is below 392 ft.

In North Turner Valley, North Clonmel Petroleums 1, LSD 16, 7-19-2w5, important outpost test to the west of production, got the Dalhousie sand at 8,000 ft. and the Kootenay at 8,090 ft. Test is logging only 10 ft. lower than Atlas-British Dominion 2 producer, though in the upper formation the grit-bed marker was 1,000 ft. lower. Arrangements have been made to carry the test below the original 8,200-ft. contract depth.

Taber Field

In the Taber field, southern Alberta, Standard of British Columbia 1, LSD 9, 18-9-16w4, largest crude producer in Alberta outside Turner Valley has been shut in after making about 7,500 bbl. on the pump. Contract deliveries to the Huff refinery at Lethbridge have been completed, and the well is closed pending arrangements for marketing further production. The pumping output averaged around 300 bbl. daily, with no indications of any decline during the test. Clancey-Hi Test Petroleums 1, LSD 7, 24-9-17w4, was abandoned at 3,247 ft. after getting noncommercial oil shows in a tight

(Continued on Page 83)

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KANSAS, NEBRASKA

McPherson County Well Makes Large Potential

By CARL HOOT

LARIO Oil and Gas Co.'s 1 Hoffman, a 1¾-mile southwest extension to the Lindsborg pool of McPherson County, was given state potential of 3,000 bbl. after making a prolific flow of oil from the Viola lime at 3,402-06 ft. The Lindsborg pool has been the most active spot in Kansas over the past few weeks and an outpost well of this size will open a large area for immediate drilling. This well is the third strike for McPherson County within the past two months. In the latter part of September, Westgate-Greenland Oil Co. 1 Crowther flowed 150 bbl. of oil a day, natural, to open a new Mississippian chat pool 2 miles southeast of the Henne pool and near the town of Roxbury. The same company's 1 Lilly, 2½ miles south of the Roxbury pool, found pay in the chat at 2,660 ft. and flowed 160 bbl. in 8 hours.

The Doran pool of Rice County received a ½-mile west extension when C. H. Weaver 1 Katterjohn, E½, NE SW, made state potential of 1,321 bbl. of oil a day from Arbuckle dolomite at 3,276 ft. Total depth was 3,291 ft.

Prospects of another Arbuckle dolomite pool in Barton County were good last week when Falcon-Seaboard Drilling Co. 1 Holmes, CNL NW SW 1-20-14w, found saturation and a good show of oil in lime at 3,501 ft. Location of the well is 2½ miles southwest of Great Bend, 5 miles north of the Hiss Lansing-Kansas city pool, 5 miles south of Heizer and an equal distance of about 12 miles from Pawnee Rock on the west and Silica on the east. A good well here would throw open several square miles for further development.

Kansas daily average production for October was 295,200 bbl., compared with 246,660 bbl. for the same period last year. The Corporation Commission has set the November allowable production at 300,700 bbl., a new high for the state.

KANSAS COMPLETIONS

Wildcats

McPherson County: Dickey Oil 1 Decker, W½ NW SE 7-2-1w, dry, T.D. 3,072 ft., Lansing 2,365 ft., Mississippi lime 3,022 ft.

Rooks County: W. L. Hartman 1-A Anderson, S½ SW SW 28-9-16w, dry, T.D. 3,424 ft., Lansing 3,198 ft., show of oil 3,320 ft.

Rush County: Helmerich & Payne 1 Brannon, NW cor. 28-19-17w, dry, T.D. 3,960 ft., Lansing 3,532 ft., conglomerate 3,874 ft., Arbuckle 3,892 ft.

Stafford County: Cities Service 1 Walker, NE NE SE 10-24-15w, dry, T.D. 4,160 ft., Viola 3,984 ft., Simpson shale 4,014 ft., Simpson sand 4,025 ft., Arbuckle 4,044 ft., show oil 4,046 ft., some free oil in sandy shale 4,057 ft.

Fields

Beaumont, Greenwood County: K. T. Wiedemann 3-D Lewis, SW SE 26-27-8e, dry, T.D. 2,841 ft.

Chase, Rice County: Bay Pet. 1 Argo-Smith, NW NW 16-20-9w, pumped 198 bbl., Arbuckle 3,270-76 ft.

Drach, Stafford County: Stanolind 2-C Harms, N½ NW NE 18-22-12w, pumped 100 bbl., Arbuckle 3,686-91 ft.

Gorham, Russell County: Skelly 1 Dillner, E½ NW SW 36-13-15w, pumped 70 bbl., Arbuckle 3,304-08 ft.

Kraft-Prusa, Barton County: Republic Natural Gas 4 Harzman, NE SW SW 33-16-11w, dry, T.D. 3,335 ft.

Lindsborg, McPherson County: Bay Pet. 2 Johnson, W½ NW NE 7-17-3w, pumped 347 bbl., Viola 3,374-77 ft.

Auto Ordnance 2 Anderson, W½ SE SE 8-17-3w, dry, T.D. 3,521 ft., Viola 3,339 ft., Simpson sand 3,491 ft., show dead oil 3,491 ft.

Bay Pet. 1 Fagerberg, W½ NW NW 8-17-3w, pumped 248 bbl., Viola 3,346-76 ft., T.D. 3,496 ft.

Auto Ordnance 2 Melander, W½ NW NW 9-17-3w, dry, T.D. 3,490 ft., Viola 3,340 ft., Simpson sand 3,476 ft.

Ray, Phillips County: Cities Service 1-B States, SW SE SW 30-5-20w, 2,160 bbl., Lansing 3,642-47 ft., T.D. 3,692 ft.

Stoltenberg, Ellsworth County: Cities Service 4 Kralik, SE NW 8-16-10w, pumped 81 bbl. in 8 hr., Arbuckle 3,310-22 ft.

NEBRASKA

ST. JOSEPH, Mo.—Events in the Forest City basin continue to be uniformly unexciting, there being no reports at all from Richardson County. Heuisman 1 Bracy, NW SW 12-11s-21e, Leavenworth County, Kansas, was dry and abandoned at 1,116 ft. In the same county, Charles Miller 2 Miller, NE SW 22-9s-20e, was drilling at 938 ft. McLaughlin 1 Charles Miller, SW SW 22-9s-20e, Leavenworth County, was shut down for repairs at 110 ft. O. J. Connell 3 Ralph Edmonds, SE NE 21-9-20e, Jefferson County, Kansas, was shut down at 1,440 ft.

MICHIGAN OPERATIONS

Continued Decline of Michigan Operations Predicted

By OTTO C. PRESSPRICH

SAGINAW, Mich. — After about the quietest week of the year, in which only seven drilling completions were recorded, Michigan oil operators foresaw a continued lull in operations for the balance of the year.

Contributing to that outlook was the fact that only eight more drilling permits had been issued by the state Conservation Department and a survey indicating that only 160 drilling operations are in progress, slightly more than half the total a year ago. Four of the permits are for Van Buren County tests. Other locations are in Arenac, Calhoun, Mecosta, and Ottawa County. The permit total for the year stood at 469.

Of the week's seven completions, one produced oil while two were gas wells. The new oil well Smith Petroleum Co. 1 Carpenter, in Section 6 of Fork Township, Mecosta County, flowed 492 bbl naturally in 24 hours and production stepped up considerable after acid treatment.

Revising earlier estimates, P. J. Hoffmaster, state supervisor of wells, now fears Michigan production will decline and it is unlikely that the November federal quota of 64,500 bbl. a day can be attained. Mr. Hoffmaster estimated October production at 63,000 bbl. a day.

"There has been more exploration work this year than ever before in Michigan," he declared. "But less oil has been found. Unless we find something we can't see now, we'll be producing less."

The Advisory Committee considered establishing a commission to study turning back into use the estimated 23,000,000 cu. ft. of gas wasted daily in the leading Reed City field. The gas is impractical for use as fuel, but the Advisory Board believes the gas may be returned to the soil to restore pressures and permit recovery of additional oil.

MICHIGAN COMPLETIONS

Allegan County, Overisel Township: E. W. Leeder 1 Johannes-Naber, SE NE NE 6-4n-14w, wildcat dry hole, T.D. 1,549 ft.

Arenac County, Adams Township: Smith Petroleum Co. 1 Allen, SW SW SW 13-19n-3e, wildcat test, dry, T.D. 3,030 ft.

Clare County, Redding Township: Taggart Brothers Co. 2 State-Williams, C NE 6-19n-6w, 2,680,000 cu. ft. gas, T.D. 1,323 ft.

Winterfield Township: Taggart Brothers Co. 108 Tope-Merrill School, C SW 33-20n-6w, 7,010,000 cu. ft. gas, T.D. 1,302 ft.

Lake County, Sauble Township: Swanson Consolidated Oil Co. 1 Kragnes, NE SW SW 15-19n-14w, wildcat test, dry, T.D. 2,162 ft.

Mecosta County, Fork Township: Smith Petroleum Co. 1 Carpenter, NE SE SE 6-16n-7w, 492 bbl. naturally first 24 hr., acidized for 525 bbl., pinched, T.D. 3,826½ ft.

Ottawa County, Zeeland Township: H. C. Williams 1 Roelofs, SE SE SW 32-5n-14w, dry hole, T.D. 1,540 ft.

Review of Stripper Wells To Feature Compact Meeting

OKLAHOMA CITY, Okla. — Strippers, which constitute three-fourths of the producing oil wells of the nation, will be the principal subject for study by the Interstate Oil Compact Commission at its annual organization meeting, to be held December 18 and 19 in the Biltmore Hotel, Oklahoma City, Okla., Charles L. Orr, secretary, announced last week.

More than 300,000 of these small wells, yielding an average of only a few barrels a day, are now being operated with production expenses approximating income. Their continued production is necessary and vital to win the war.

The Compact Commission, through its research and coordinating committee, is cooperating with the National Stripper Well Association in compiling a nation-wide survey to be reported at the meeting.

A committee composed of J. C. Hunter of Texas, Hiram M. Dow of New Mexico, P. J. Hoffmaster of Michigan, Harold Ostertag of New York, and N. W. Shiarella of Kentucky, will report and make recommendations for the extension of the compact which expires in 1943.

Standing committees are collaborating and will meet together to make joint recommendations for natural-gas conservation.

Annual election of officers will be held, committees will be appointed, and plans made for the coming year at the meeting.

Appalachian Fields

(Continued from Page 64)

cu. ft. gas, Oriskany 5,121 ft., shot 5,128-46 ft., R.P. 1,765 lb., T.D. 5,165 ft.

United Fuel Gas Co. 5110 F. B. Mays, 4,093,000 cu. ft. gas, Oriskany 5,239-85 ft., R.P. 1,650 lb., T.D. 5,295 ft.

United Fuel Gas Co. 5124 G. A. Randolph, 5,955,000 cu. ft. gas, Oriskany 5,031 ft., R.P. 1,625 lb., 24 hr., T.D. 5,045 ft.

Washington district: United Fuel Gas Co. 5094 J. W. Scarberry, 6,755,000 cu. ft. gas, Oriskany 5,070 ft., gas 5,070-78 ft., T.D. 5,083 ft.

Spartan Gas Co. 2 B. F. Castro, 8,572,000 cu. ft. gas Oriskany 5,017 ft., gas 5,020-34 ft., not shot, T.D. 5,034 ft.

Putnam County, Union district: Godfrey L. Cabot, Inc., 1062 Putnam Co., 2,439,000 cu. ft. gas, Oriskany 5,153 ft., shot 5,133-83 ft., T.D. 5,232 ft.

Illinois Fields

(Continued from Page 69)

pumped 540 bbl., Trenton 2,318 ft., pay 2,327-40 ft., T.D. 2,340 ft.

St. James, Fayette County: P. Doran 4 Kisther, NE SW NW 36-6n-2e, pumped 44 bbl., shot 1,609-16 ft., Weller 1,608 ft., T.D. 1,620 ft.

St. Paul, Fayette County: Luttrell et al 1 Ruben, NW NE NE 31-5n-3e, pumped 66 bbl., Benoist 1,901 ft., 10-qt. shot 1,901-13 ft., T.D. 1,913 ft.

Homer Luttrell 3 Ford, SE SE NW 31-5n-3e, pumped 7 bbl. oil and 26 bbl. water, Benoist 1,901-7 ft., T.D. 1,907 ft.

South Lawrence, Lawrence County: Bell Bros. 4 Hall, NW NW SW 24-2n-12w, dry at 2,074 ft., McClosky 2,031 ft.

Smith & Nye 1-B Spidel, SE SW SW 23-2n-12w, pumped 255 bbl., Biehl 1,372-83 ft., T.D. 1,383 ft.

South Mason, Effingham County: Tide Water 4 Burk, SE NE SW 27-6n-5e, pumped 90 bbl., Aux Vases 2,361 ft., 40-qt. shot 2,365-79 ft., T.D. 2,379 ft.

Storms, White County: Sinclair-Wyoming 17 Rudolph, NE NW NW 13-6s-9e, pumped 60 bbl., Waltersburg 2,265 ft., 10-qt. shot 2,272 ft., T.D. 2,276 ft.

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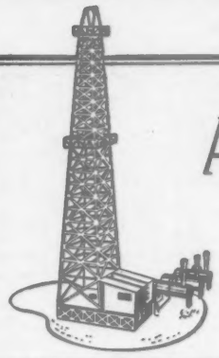

Among the Drilling

Removal of Drilling Price Ceiling Clears Outlook for Contractors

REMOVAL of price ceilings from the service of drilling oil and gas wells, announced in Washington, D. C., last week by the Office of Price Administration, was welcomed throughout the oil country by contractors. Drilling contractors had been unable to satisfy themselves that their interpretations of the previous price ceiling was in conformity with the letter and spirit of OPA regulations.

Establishment of price ceilings on contract drilling threatened to drive many more rigs into retirement. In fact, several contrctors had been forced to stack their rigs because creditors had refused to sanction use of the equipment on jobs which could not conceivably return a profit. Contractors' costs have been rising steeply, chiefly because of the current necessity of working crews over the maximum number of hours in order to maintain experienced men in charge of equipment.

Contractors pointed out this week that price ceilings on crude oil and products act as an automatic check on the price obtainable for drilling. Operating companies, it was added, cannot be parties to any unwarranted rise in the contract price because of the tight OPA control maintained over the price of products.

Effective last week, Amendment 7 to Revised Supplementary Regulation 11 to General Maximum Price Regulations also exempts oil-field fire-fighting services as well as drilling operations.

Exemptions were granted, OPA spokesman pointed out, because each individual well and fire present their own particular problems and no fixed price or standard of pricing can be made to apply to all cases.

In many cases, OPA said, the contract price for drilling is payable in cash, while in others the contractor agrees to take an interest in the well. Differences in depth, size of hole, number of casing strings needed, number of cores to be taken, differences in formations, proximity to water, fuel and supplies, amount of risk assumed and many other factors enter into the price for each individual drilling operation.

Exemptions granted by Amendment 7 cover all necessary operations in connection with well drilling, such as preparation of location, fishing jobs, pulling, salvaging, and plugging operations.

Extinguishing oil or gas-well fires is highly specialized work. Agreements on the price to be charged are usually reached after an examination of the blaze. The operation, while sometimes requiring months, may under some circumstances be concluded in only a few hours.

As a result of the exemption, OPA officials expected a number of contracts to be signed, which have been held up because no determination could be made on ceiling prices.

SIXTY wells were drilling last week in the Allegany oil field, in Pennsylvania, compared with 70 drilling at the end of September, according to a monthly survey of operations in the field.

GEORGE P. LIVERMORE, drilling contractor of Lubbock, Tex., was drilling below 3,000 ft. on L. A. Helms 1 J. T. Harris, a wildcat in Section 103, Block M-10, B.S.&F. Survey, Swisher County, Texas. The test is 5 miles north of a recent test in the area.

GORDON Oil Co. has been awarded a contract to drill a wildcat test, location for which has been staked by Peter J. Bolger, in 11-25n-12w, Grant Township, Grand Traverse County, Michigan, on a 12,000-acre block held in Grant and adjoining counties. The test will be to the Dundee objective with rotary tools.

ERVIN MAJOR will drill Ervin Major, Standish 1 Floyd Hull, in C SE NW 27-19n-3e, Arenac County, Michigan.

F. O. WILKINS has been awarded contract to drill Gulf Refining Co., Eastern Production Division, 1 D. H. Hubbard, in SE SE NW 21-15n-7w, Mecosta County, Michigan.

HELMERICH & PAYNE, Tulsa drilling contracting firm, has been awarded a contract to drill Hunt Oil Co. 1 McMillen & Turner, a 5,000-ft. Ordovician wildcat in extreme southern Otero County, in the Southeast New Mexico sector of the Permian basin. Derrick is now being built for the test, which will be drilled with cable tools in the SE 5-26s-16e.

JOHN WILSON, drilling contractor of Grand Rapids, Mich., will drill a wildcat for Rex Oil & Gas Co. 1 Oakes, in C NE SE 10-11n-1w, Gratiot County, Michigan.

STAKES are being set for the H. J. Porter 1 M. M. Garcia, 4,000 ft. southwest of the Rincon pool in Starr County, Texas. The test, contract depth of which is 4,000 ft., will be drilled in Porcion 91.

UNGREN & FRAZIER, Abilene, Tex., have the contract to drill a Jones County, Texas, wildcat which has been staked by G. E. Kadane & Sons, Wichita Falls, Tex., to be the 1 O. W. Wiley, the location is 330 ft. from the east and 900 ft. from the south line of Section 2-1-T.&P., 1½ miles north of Nugent. There are about 450 acres in the block. It is to be a 2,150-ft. test to the Swastika sand.

JORDAN Drilling Co. and John Mayo, of Houston, Tex., and Edwin M. Jones, of San Antonio, Tex., have spotted location for a 6,500-ft. Wilcox sand wildcat between Leggett and Hortense, in Polk County, Texas. It is the 1 Texas Long Leaf Lumber Co., 660 ft. from the north and east lines of a 50-acre tract in the I. D. Thomas Survey. The test is located on a block of 1,500 acres and contributors include Gulf, Rycade, and Arkansas Fuel Oil Co.

NOBLE Drilling Co. 1 Gregory, in C SE NW 36-1s-24w, southwest of Eldorado, Okla., in Jackson County, was drilling at 7,442 ft. in lime.

PORTABLE Drilling Co., who has the contract for 1 B. V. Murray et al, in C NW SE 24-13n-4e, west of Sparks, in Lincoln County, Oklahoma, was making fast time. The well was originally carried in Portable Drilling's name. Murray and associates have 3,000 acres of leases in the area.

INGLING & PARKER Drilling Co., Wichita, Kans., has staked 1 Blaser, in SE SE SW 30-27n-2e, south of Kildare, in the abandoned Garrett field, Kay County, Oklahoma.

MUSKEGON Development Co. has the contract for Chapman Oil Co. 1 Arthur Dore, C W½ NW NW 33-15n-4e, Bay County, Michigan.

Contractors

Contractors Complete Program For Second Annual Meeting

OIL WELL drilling contractors will give attention to current problems confronting the drilling fraternity when they gather at Tulsa 2 weeks hence for the second annual meeting of the American Association of Oilwell Drilling Contractors. Sessions will be held at Hotel Mayo, and the opening gathering, November 19, will be devoted to committee meetings, with special emphasis on ODT, WPB, OPC and Department of Labor problems. The afternoon session will be given over to committee reports and an open session, and at least one paper on a pressing government problem. A feature of the annual banquet Thursday evening, will be a talk by an OPC speaker, probably on priorities. Elmo Thompson, Superior Oil Corp., Tulsa, will be toastmaster.

J. E. Brantly, president of the American Association of Oilwell Drilling Contractors, who presided at the convention and addressed the Friday morning meeting

J. E. Brantly, association president, will address the Friday morning meeting, and he will be followed by Gus C. Street, Jr., Dallas, Tex., who will speak on wages and hours. An address on "Manpower and Selective Service," by an Army speaker, and a paper on "Cooperation Among Drilling Contractors," by Howard P. Holmes, will complete this session.

Friday afternoon, Congressman Wesley E. Disney, of Oklahoma, will deliver the principal address on various national problems. This meeting will also feature a paper on "Making the Most of What We Have," by J. S. Montgomery, general superintendent, northern region, Phillips Petroleum Co., Bartlesville, Okla.

The meeting will be held before the advent of gasoline rationing, an advantage to drillers living nearby who wish to drive to the meeting. The association hopes to present a well-known speaker on rationing at this meeting, with a view to clarifying numerous orders now affecting truck and fleet owners.

●

OLSON Drilling Co., of Midland, Tex., and Tulsa, is the contractor on a scheduled 9,000-ft. wildcat in northwestern Sterling County, West Texas, by Col-Tex Refining Co., a branch of Anderson-Prichard Oil Corp., Oklahoma City. It will be 1 W. N. Reed, C NW SW 8-30-W.& N.W., 15 miles northwest of Sterling City, on a block of 21 sections. Rotary-rig materials have been moved in.

FRED POSTELLE, drilling contractor of Odessa, Tex., expected to spud in this week at Ohio Oil Co. 1 L. T. Clark & Son, scheduled 8,000-ft. wildcat in C NE SW 6-A-G.C.& S.E., southeastern Sterling County, Texas, 9 miles west of Water Valley.

Crew of M. B. K. Drilling Co., Oklahoma City, Okla. The men are: Jim Dunn, driller; E. C. Ogle, fireman; W. Williams, pipe racker; L. A. Shelton, derrickman; Fred Smith, floor man; S. G. Mathis, driller; W. H. Smiley, co-owner and pusher, and S. T. Walker, superintendent, Carey Operating account

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CRUDE PRICES . . .

OKLAHOMA AND KANSAS GRAVITY TABLES

	1	2	3	4	5	6	7
Below 21					$.85	$.75	
21-21.9					.87	.78	
22-22.9					.89	.81	
23-23.9					.91	.84	
24-24.9					.93	.87	
Below 25	$.93			$.86			
25-25.9	.95	$.95		.88	.95	.90	
26-26.9	.97	.97		.90	.97	.93	
27-27.9	.99	.99		.92	.99	.96	
28-28.9	1.01	1.01	$1.01	.94	1.01	.99	
29-29.9	1.03	1.03	1.03	.96	1.03	1.02	
30-30.9	1.05	1.05	1.05	.98	1.05	1.05	$1.05
31-31.9	1.07	1.07	1.07	1.00	1.07	1.07	1.07
32-32.9	1.09	1.09	1.09	1.02	1.09	1.09	1.09
33-33.9	1.11	1.11	1.11	1.04	1.11	1.11	1.11
34-34.9	1.13	1.13	1.13	1.06	1.13	1.13	1.13
35-35.9	1.15	1.15	1.15	1.08	1.15	1.15	1.15
36-36.9	1.17	1.17	1.17	1.10	1.17	1.17	1.17
37-37.9	1.19	1.19	1.19	1.12	1.19	1.19	1.19
38-38.9	1.21	1.21	1.21	1.14	1.21	1.21	1.21
39-39.9	1.23	1.23	1.23	1.16	1.23	1.23	1.23
40 and above	1.25	1.25	1.25	1.18	1.25	1.25	1.25

OKLAHOMA AND KANSAS TABLE EXPLANATION

COLUMN (1) MID-CONTINENT GRADES:
Pure Oil Co., 5-20-41.
Gulf Oil Corp., 5-20-41.
Skelly Oil Co. (Kansas only), 5-19-41.
H. F. Wilcox Oil & Gas Co., 5-20-41.

COLUMN (2) MID-CONTINENT GRADES:
White Eagle Oil Purchasing Co., Inc., 5-19-41, Kansas only.
Sinclair Prairie Oil Marketing Co., 5-20-41.

COLUMN (3) MID-CONTINENT GRADES:
Continental Oil Co., 5-19-41.
Phillips Petroleum Co., 5-19-41.
Tide Water Associated Oil Co., 5-20-41.

COLUMN (4) JACKSON, TILLMAN COUNTIES:
Gulf Oil Corp., 5-20-41.

COLUMN (5) MID-CONTINENT GRADES:
Standard Oil Co. (Indiana), 5-20-41.
National Refining Co., 5-20-41.

COLUMN (6) MID-CONTINENT GRADES:
Magnolia Petroleum Co., 5-21-41.
Shell Oil Co., Inc., 5-19-41.
Shell, in Carter County 12-5-41.
Ben Franklin Refining Co., 12-4-41.
Carter Oil Co. (Oklahoma only), 5-19-41.

COLUMN (7) OKLAHOMA:
Champlin Refining Co., 5-20-41.

OKLAHOMA FLAT PRICE

Cumberland	$1.14
Pure Oil Co., 9-4-41.	

Canadian Fields

Imperial Oil, Ltd.:	
Petrolia, 11-6-39	$2.10
Oil Springs, 11-6-39	2.07
Bothwell, 11-6-39	2.10
Turner Valley, 7-16-41	$1.35-1.97

MIDDLE WEST FLAT PRICES
Illinois and Indiana

Ohio Oil Co.:	
Illinois basin, 5-21-41	$1.37
Eastern Illinois, 5-21-41	$1.22
Western Indiana, 5-21-41	1.22
Magnolia Petroleum Co.:	
Illinois basin, 5-21-41	$1.37
Carter Oil Co.:	
Illinois (Louden), 5-21-41	$1.37
Sohio Corp.:	
Illinois basin, 5-21-41	$1.37
Texas Co.:	
Illinois basin 5-21-41	$1.37
Gulf Refining Co.:	
Illinois basin 5-21-41	$1.37

Michigan

Simrall Corp., 5-27-41:	
Greendale, Porter, Vernon, Crystal, and Wise	$1.44
Buckeye, Bentley, Edenville, Beaverton, and Monitor (sweet)	1.42
Freeman, Redding, Lincoln, and Winterfield	1.39
Hamilton-Grout	1.29
West Branch-Arenac	1.24
Sohio Corp., 5-1-41:	
Bloomingdale-Columbia	$1.38
Mid-West Refineries, Inc., 5-1-41:	
Kent County	$1.38
Pure Oil Co., 5-27-41:	
Sherman	$1.39
Midland (Midland County)	1.44

EASTERN STATES
Pennsylvania and Ohio

South Penn Oil Co.:	
National lines, 3-26-42	$3.00
Southwest Penn, 3-26-42	2.65
Eureka lines, 3-26-42	2.59
Corning grade, 5-27-41	1.31
Tide Water Associated Oil Co.:	
Bradford, 3-26-42	$3.00
Allegany, N. Y., 3-26-42	3.00
Pennzoil Co.:	
Group A, 3-26-42	$2.93
Group B, 3-26-42	2.92
Group C, 3-26-42	2.91
Group D, 3-26-42	2.90
Group E, 3-26-42	2.88
Quaker State Oil Refining Corp.:	
In Buckeye lines, 3-26-42	$2.55
In Eureka lines, 3-26-42	2.59

Kentucky

Ashland Oil & Transportation Co., 6-19-41:	
Big Sandy River	$1.38
Kentucky River	1.43
Sohio Corp., 5-21-41:	
Birk City	$1.32

West Virginia

Pure Oil Co.:	
Cabin and Kelly Creek, 3-27-42	$2.59
Smackover (heavy)	$0.93
Dorcheat	1.15
Phillips Petroleum Co., 5-22-41:	
Smackover (heavy)	$0.89
Placid Oil Co., 5-22-41:	
Tullos-Urania (5-21-41)	$1.15
Cotton Valley dist. (above 60°)	1.30
Cotton Valley (Holloway sand)	1.25
Cotton Valley (Bodcaw-D sands)	1.20
Pure Oil Co.:	
Bosco (5-21-41)	$1.14
Sweet Lake (5-22-41)	1.06
Creole (5-22-41)	1.16
Republic Oil Co., 6-2-41:	
Nevada County, Arkansas	$0.80
Shell Oil Co., Inc., 5-20-41:	
Happytown	$1.15
Standard Oil Co. of Louisiana, 5-22-41:	
Big Creek, Dorcheat, McKamie (sour)	$1.15
Smackover (heavy)	.83
Cotton Valley distillate (9-1-41)	1.40
Cotton Valley (Holloway sand)	1.25
Lisbon distillate	1.20
Republic Oil Refining Co., 5-21-41:	
Bayou Pigeon	$1.20
Texas Co., 5-21-41:	
Erath	$1.21
Garden Island	1.36
Lafitte, Paradis	1.19
Lake Mongoulois	1.36

ROCKY MOUNTAIN GRAVITY TABLE

Below 29	$0.96
29-29.9	.98
30-30.9	1.00
31-31.9	1.02
32-32.9	1.04
33-33.9	1.06
34-34.9	1.08
35-35.9	1.10
36-36.9	1.12
37-37.9	1.14
38-38.9	1.16
39-39.9	1.18
40 and above	1.20

Stanolind Oil & Gas Co., 5-20-41, includes Dutton Creek, Midway, and Salt Creek except Tensleep crude, Wyoming.

Sinclair-Wyoming Oil Co., 5-20-41, includes Salt Creek and Lost Soldier, except Tensleep crude, Wyoming.

Continental Oil Co., 5-21-41, includes Fort Collins and Wellington, Colorado

Wyoming

Ohio Oil Co.:	
Rock River (5-20-41)	$1.18
Lance Creek (7-1-41)	1.13
Elk Basin and Grass Creek (light)	1.00
Stanolind Oil & Gas Co., 5-20-41:	
Frannie (light)	.70
Frannie (heavy)	.47
Grass Creek (light)	1.00
Grass Creek (heavy)	.50
Hamilton dome	.45
Elk basin	1.00
Salt Creek (Tensleep)	.6785
Continental Oil Co.:	
Big Muddy (5-30-41)	$1.08
Lance Creek (9-1-41)	1.13

Montana

Continental Oil Co., 4-1-41:	
Cat Creek	$1.15

Colorado

Stanolind Oil & Gas Co., 5-20-41:	
Iles	$1.07
Continental Oil Co., 5-21-41:	
Canon City-Florence	$1.08

TEXAS GULF COAST GRAVITY TABLES

	(1)	(2)	(3)	(4)	(5)
Below 20	$1.06	$1.06		$.98	$.93
20-20.9	1.08	1.08		1.00	.98
Below 21			$1.08		
21-21.9	1.10	1.10	1.10	1.02	.97
22-22.9	1.12	1.12	1.12	1.04	.99
23-23.9	1.14	1.14	1.14	1.06	1.01
24-24.9	1.16	1.16	1.16	1.08	1.03
25-25.9	1.18	1.18	1.18	1.10	1.05
26-26.9	1.20	1.20	1.20	1.12	1.07
27-27.9	1.22	1.22	1.22	1.14	1.09
28-28.9	1.24	1.24	1.24	1.16	1.11
29-29.9	1.26	1.26	1.26	1.18	1.13
30-30.9	1.28	1.28	1.28	1.20	1.15
31-31.9	1.30	1.30	1.30	1.22	1.17
32-32.9	1.32	1.32	1.32	1.24	1.19
33-33.9	1.34	1.34	1.34	1.26	1.21
34-34.9	1.36	1.36	1.36	1.28	1.23
35-35.9	1.38		1.38	1.30	1.25
36-36.9	1.40		1.40	1.32	1.27
37-37.9	1.42		1.42	1.34	1.29
38-38.9	1.44		1.44	1.36	1.31
39-39.9	1.46		1.46	1.38	1.33
40 and above	1.48		1.48	1.40	1.35

TEXAS GULF COAST GRAVITY TABLE EXPLANATION

COLUMN (1):
Humble Oil & Refining Co., 5-21-41, includes Amelia, Clear Lake, Goose Creek, Hastings, Magnet, Mykawa (new), Raccoon Bend, South Thompsons Sugarland, Thompson, and Webster fields.

Stanolind Oil & Gas Co., 5-21-41, includes West Beaumont, High Island, and Spindletop.

Sinclair Prairie Oil Marketing Co., 5-21-41.

Stanolind Oil Purchasing Co., 4-9-42, includes Clinton and Lake Creek.

Pure Oil Co., 4-21-41, includes Louise and Ganado.

Gulf Refining Co., 5-21-41, includes Spindletop, Sour Lake, Lovells Lake,

LOUISIANA AND SOUTHERN ARKANSAS GRAVITY TABLE

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Below 18													$.94					
18-18.9													.96					
19-19.9													.98					
Below 20								$1.06		$.94	$.99	$.89	1.00		$1.06			
20-20.9								1.08		.96	1.01	.91	1.00		1.08			
Below 21	$.68			$.90										$.90				
21-21.9	.70			.92				1.10		.98	1.03	.93	1.02	.92	1.10			
22-22.9	.72			.94				1.12		1.00	1.05	.95	1.05	.94	1.12			
23-23.9	.74			.97				1.14		1.02	1.07	.97	1.08	.96	1.14			
24-24.9	.76			.98				1.16		1.04	1.09	.99	1.11	.98	1.16			
Below 25		$.86	$.98			$.88												
25-25.9	.78	.88	1.00	1.00		.90		1.18		1.06	1.11	1.01	1.14	1.00	1.18			
26-26.9	.80	.90	1.02	1.02		.92		1.20		1.08	1.13	1.03	1.17	1.02	1.20			
27-27.9	.82	.92	1.04	1.04		.94		1.22		1.10	1.15	1.05	1.19	1.04	1.22			
28-28.9	.84	.94	1.06	1.06		.96		1.24		1.12	1.17	1.07	1.21	1.06		$1.14	$1.06	
29-29.9	.86	.96	1.08	1.08		.98		1.26		1.14	1.19	1.09	1.23	1.08		1.16	1.08	
30-30.9	.88	.98	1.10	1.10	$1.28	1.00		1.28		1.16	1.21	1.11	1.25	1.10		1.18	1.10	$1.05
31-31.9	.90	1.00	1.12	1.12	1.30	1.02		1.30	$1.07	1.18	1.23	1.13	1.27	1.12		1.20	1.12	1.07
32-32.9	.92	1.02	1.14	1.14	1.32	1.04		1.32	1.09	1.20	1.25	1.15	1.29	1.14		1.22	1.14	1.09
33-33.9	.94	1.04	1.16	1.16	1.34	1.06		1.34	1.11	1.22	1.27	1.17	1.31	1.16		1.24	1.16	1.11
34-34.9	.96	1.06	1.18	1.18	1.36	1.08		1.36	1.13	1.24	1.29	1.19	1.33	1.18		1.26	1.18	1.13
35-35.9	.98	1.08	1.20	1.20	1.38	1.10			1.15					1.20		1.28	1.20	1.15
Below 36							$1.07											
36-36.9	1.00	1.10	1.22	1.22	1.40	1.12	1.09		1.17					1.22		1.30	1.22	1.17
37-37.9	1.02	1.12	1.24	1.24	1.42	1.14	1.11		1.19									1.19
38-38.9	1.04	1.14	1.26	1.26	1.44	1.16	1.13		1.21									1.21
39-39.9	1.06	1.16	1.28	1.28	1.46	1.18	1.15		1.23									1.23
40 & above	1.08	1.18	1.30	1.30	1.48	1.20	1.17		1.25									1.25

LOUISIANA AND SOUTHERN ARKANSAS TABLE EXPLANATION

Standard Oil Co. of Louisiana, 5-22-41.

COLUMN (1) applies to Atlanta, Buckner, Magnolia, Schuler (Jones sand), Village, and Lewisville fields.

COLUMN (2) applies to De Soto, Sabine, Fouke, Homer, Miller County, Sugar Creek, and Nebo.

COLUMN (3) applies to Bunkie, Eola, Olla, and South Olla.

COLUMN (4) applies to Bayou Mallet, Choctaw, Darrow, Jeanerette, Lirette, North Crowley, South Crowley, Port Barre, Potash, Roanoke, St. Martinville, and Port Allen.

COLUMN (5) applies to University (Baton Rouge). Posted 6-2-42.

COLUMN (6) applies to Cotton Valley crude, Rodessa and Shreveport (Cross Lake); also Anse La Butte, effective 8-1-41, starting at 80 cents for below 21°, also, to Caddo effective 10-15-41.

Continental Oil Co., 5-21-41.

COLUMN (7) applies to Abbeville, Louisiana.

Stanolind Oil & Gas Co., 5-21-41.

COLUMN (8) applies to East and West Hackberry.

COLUMN (6) applies to Caddo Parish, effective 10-15-41.

COLUMN (9) applies to Evangeline, Acadia Parish.

Lion Oil Refining Co., 5-22-41.

COLUMN (1) applies to Reynolds lime, Jones sand, Schuler, Ark.

COLUMN (2) applies to El Dorado, West and South Rainbow fields, Snow Hill, and Schuler-Morgan sand.

Placid Oil Co., 5-22-41.

COLUMN (3) applies to Olla.

COLUMN (2) applies to Nebo field.

Shell Oil Co., Inc., 5-20-41.

COLUMN (10) applies to Roanoke, Chalkley.

COLUMN (11) applies to Iowa, Black Bayou, White Castle.

COLUMN (12) applies to Gibson, South Houma, Hester, West Lake Verret.

Magnolia Petroleum Co., 5-21-41.

COLUMN (13) applies to Lockport, Cameron Meadows, and West Gueydan, La.

COLUMN (6) applies to Haynesville, Cotton Valley, Rodessa, La., and Miller County, Arkansas.

Phillips Petroleum Co., 3-29-41.

Arkansas Fuel Oil Co., 2-19-42.

COLUMN (1), Schuler (Jones sand), except schedule starts at 76 cents for below 25° gravity.

Gulf Refining Co., 5-21-41.

COLUMN (9), Jennings.

COLUMN (8), Edgerly, Starks, Vinton East Hackberry, Cameron Meadows, and Leesville.

COLUMN (16) applies to Grand Bay, Quarantine Bay, Timbalier Bay, and West Bay, except schedule starts at $1.12 for below 28° gravity.

COLUMN (6) applies to Caddo, Homer, Bull Bayou, Crichton, De Soto, Haynesville, and El Dorado.

COLUMN (4) applied to West Gueydan, effective 5-25-42.

Pure Oil Co., 4-22-41.

COLUMN (14) applies to Gueydan crude.

COLUMN (6), Caddo, Homer, Haynesville, Bull Bayou, Crichton, De Soto, and El Dorado.

Texas Co., 5-21-41.

COLUMN (6) applies to North Louisiana.

COLUMNS (15) and (16), Bay St. Elaine, Caillou Island, Iberia, Lake Barre, Lake Pelto, Leesville, Port Barre. (Schedules A and B).

COLUMN (17), Bateman Lake, Dog Lake, Fausse Point, Horseshoe Bayou, Jefferson Island, Plumb Bob, Vermilion Bay, West Cote Blanche, and Delta Duck Club.

COLUMN (18), Delta Farm, Lake Salvador, Golden Meadow.

LOUISIANA AND ARKANSAS FLAT PRICES

Continental Oil Co., 5-21-41:	
Tepetae and Lake Arthur	$1.18
Ville Platte	1.20
Gulf Refining Co., 5-21-41:	
Smackover (Ark.)	$0.83
Lion Oil Refining Co., 5-22-41:	

West Beaumont, Goose Creek, South Liberty, Big Creek, Blue Ridge, Fannett, Moore, Barbers Hill, Hankamer, Thompson, Lochridge, Dyersdale, and Hull (old).

Sun Oil Co., 5-21-41, includes Barbers Hill, Batson (old), Bayou Blue, Chacahoula, Cotton Lake, Esperson (below 35° gravity), Fausse Point, Goose Creek, Greens Lake, Hackberry (east and west), Hull (below 25°), Humble (below 35°), Nome, North Dayton (below 25°), Orange, Saratoga, Sour Lake, South Liberty, and Vinton.

COLUMN (2):
Texas Co., 5-21-41, includes Arriola, Ganado, Hamman, Hillje, Humble, Kubela, Magnet, Manvel, Markham, Mauritz, Old Ocean, Pickett Ridge, Port Neches, Sour Lake, West Columbia, and Withers.

COLUMN (3):
Pan American Production Co., 5-21-41 includes Hastings and South Houston.

Stanolind Oil & Gas Co., 4-1-41, includes High Island, Spindletop, Hastings, and South Houston.

COLUMN (4):
Humble Oil & Refining Co., 5-21-41, includes Anahuac, Angleton, Cedar Point, Fishers' Reef, Hull (new and old), Pierce Junction, Red Fish Reef, and Turtle Bay.

Gulf Refining Co., 5-21-41, includes Anahuac, Hull (new), Thompson (deep), Pierce Junction, and Orange.

Sun Oil Co., 5-21-41, includes Anahuac, Caplen and Turtle Bay.

Humble Oil & Refining Co., 3-29-41, includes Dickinson, Gillock, Hardin, League City, and Rowan.

COLUMN (5):
Pan American Production Co., 5-21-41, includes Gillock, except scale starts at 95 cents below 21°.

Stanolind Oil Purchasing Co., 5-21-41, includes Fairbanks, North Houston, and Roslyn.

SOUTH TEXAS AND SOUTHWEST TEXAS GRAVITY TABLES

	1	2	3	4	5	6	7
Below 20	$1.03	$1.08	$1.08	$.89	$1.03	$1.03	$1.08
20-20.9	1.05	1.10	1.10	.90	1.05	1.05	1.10
21-21.9	1.07	1.12	1.12	.91	1.07	1.07	1.12
22-22.9	1.09	1.14	1.14	.92	1.09	1.09	1.14
23-23.9	1.11	1.16	1.16	.93	1.11	1.11	1.16
24-24.9	1.13	1.18	1.18	.94	1.13	1.13	1.18
25-25.9	1.15	1.20	1.20	.95	1.15	1.15	1.20
26-26.9	1.17	1.22	1.22	.96	1.17	1.17	1.22
27-27.9	1.19	1.24	1.24	.97	....	1.19	1.24
28-28.9	1.21	1.26	1.26	.98	....	1.21	1.26
29-29.9	1.23	1.28	....	.99	....	....	1.28
30-30.9	1.25	1.30	....	1.00	....	....	1.30
31-31.9	1.27	1.32	....	1.01	....	....	1.32
32-32.9	1.29	1.34	....	1.02	....	....	1.34
33-33.9	1.31	1.36	....	1.03	....	....	1.36
34-34.9	1.33	1.38	....	1.04	....	....	1.38
35-35.9	1.35	1.40	....	1.05	....	....	1.40
36-36.9	1.37	1.42	....	1.06	....	....	....
37-37.9	1.39	1.44	....	1.07	....	....	....
38-38.9	1.41	1.46	....	1.08	....	....	....
39-39.9	1.43	1.48	....	1.09	....	....	....
40 and above	1.45	1.50	....	1.10	....	....	....

SOUTH AND SOUTHWEST TEXAS TABLE EXPLANATION

COLUMN (1) MIRANDO:
Humble Oil & Refining Co., 5-21-41, includes Blanchard Bridwell, Colorado, Comitas, Eagle Hill, Escobas, Fitzsimmons, Glen, Government Wells (North and South), Heyser, Hoffman, Kelsey, Kohler, Loma Novia, Lundell, Manila, Mirando Valley, Placedo, Randado, Sarnosa, and Tesoro.

Magnolia Petroleum Co., 5-21-41.

Continental Oil Co., 7-1-41. Includes Hoffman, Government Wells (North and South), Lopez, Moco, Colmena, Seven Sisters, South Seven Sisters, Loma Novia, Conoco Driscoll, O'Hern, Piedre Lumbre, and Taranchauas.

American Mineral Spirits Co., 5-21-41, includes Adami and Munson.

Republic Oil Refining Co., 5-21-41, includes Heyser field crude.

COLUMN (2) REFUGIO:
Continental Oil Co., 7-1-41, includes Minnie Bock, Clara Driscoll, South Clara Driscoll, Driscoll Ranch, Orange Grove, and Wade City.

Humble Oil & Refining Co., 5-21-41, includes East White Point, Greta, Melon Creek, O'Connor-McFaddin, Plymouth, Saxet, Taft, and Tom O'Connor.

American Mineral Spirits Co., 5-21-41, includes Plymouth, Taft, and East White Point.

COLUMN (3) REFUGIO:
Texas Co., 5-21-41, includes Greta, Saxet, and Taft.

COLUMN (4) LA ROSA:
American Mineral Spirits Co., 3-29-41.

COLUMN (5) DUVAL-MIRANDO:
Sun Oil Co., 5-21-41.

COLUMN (6) DUVAL-MIRANDO:
Texas Co., 5-21-41.

COLUMN (7) NUECES COUNTY:
American Mineral Spirits Co., 5-21-41.
Republic Oil Refining Co., 5-21-41.

WEST TEXAS, PANHANDLE AND NEW MEXICO TABLE EXPLANATION

COLUMN (1):
Humble Oil & Refining Co., 5-21-41, includes Andrews, Crane, Crockett, Ector, Gaines, Glasscock, Howard, Reagan, Upton, Winkler, and Yoakum counties, West Texas, and Lea County, New Mexico.

Gulf Refining Co., 5-21-41, includes Crane, Ector, Upton, Ward, and Winkler counties, West Texas.

COLUMN (2):
Sinclair Prairie Oil Marketing Co., 5-21-41, includes West Texas and Lea County, New Mexico. Effective 5-29-41 in Eddy County, New Mexico.

Magnolia Petroleum Co., 5-21-41, includes Upton, Howard, Glasscock, Mitchell, Winkler, Cochran, Hockley, Yoakum, and Gaines counties.

COLUMN (3):
Texas Co., 5-21-41, includes Crane and Winkler counties, Texas, and Lea County, New Mexico.

COLUMN (4) TEXAS PANHANDLE:
Magnolia Petroleum Co., 7-9-41.
Continental Oil Co., 7-9-41.
Phillips Petroleum Co., 7-9-41.

COLUMN (5) WINKLER AND LEA:
Stanolind Oil & Gas Co., 5-21-41, includes Winkler County only.
Gulf Refining Co., 5-21-41, includes Lea County, New Mexico, only

COLUMN (6) GRAY COUNTY:
Texas Co., 5-21-41.
H. F. Wilcox Oil & Gas Co., 7-9-41.

COLUMN (7) LEA COUNTY:
Magnolia Petroleum Co., 5-21-41.

COLUMN (8) EDDY COUNTY:
Continental Oil Co., 5-30-41.

COLUMN (9):
Shell Oil Co., Inc., 5-20-41, includes Crane, Ector, Howard, Glasscock, Upton, Winkler, and Yoakum counties, Texas, and Lea County, New Mexico.

COLUMN (10) TEXAS PANHANDLE:
Humble Oil & Refining Co., 7-9-41.

COLUMN (11) PANHANDLE:
Sinclair Prairie Oil Marketing Co., 5-23-41.

WEST TEXAS, PANHANDLE, AND NEW MEXICO GRAVITY TABLES

	1	2	3	4	5	6	7	8	9	10	11
Below 20	$0.70	....	....	....	....	....	....	....	$0.70	$0.73	....
20-20.9	.72	....	....	....	....	....	....	....	.72	.75	....
21-21.9	.74	....	....	....	....	....	....	....	.74	.77	....
22-22.9	.76	....	....	....	....	....	....	....	.76	.79	....
23-23.9	.78	....	$0.78	....	....	....	....	....	.78	.81	....
24-24.9	.80	....	.80	....	....	....	....	....	.80	.83	....
Below 25	....	$0.80	....	....	....	....	$0.80	....	....	....	$0.83
25-25.9	.82	.82	.82	....	$0.82	....	.82	....	.82	.85	.85
26-26.9	.84	.84	.84	....	.84	....	.84	....	.84	.87	.87
27-27.7	.86	.86	.86	....	.86	....	.86	....	.86	.89	.89
28-28.9	.88	.88	.88	$0.91	.88	....	.88	$0.88	.88	.91	.91
29-29.9	.90	.90	.90	.93	.90	....	.90	.90	.90	.93	.93
30-30.9	.92	.92	.92	.95	.92	....	.92	.92	.92	.95	.95
31-31.9	.94	.94	.94	.97	.94	....	.94	.94	.94	.97	.97
32-32.9	.96	.96	.96	.99	.96	....	.96	.96	.96	.99	.99
33-33.9	.98	.98	.98	1.01	.98	....	.98	.98	.98	1.01	1.01
34-34.9	1.00	1.00	1.00	1.03	1.00	$1.03	1.00	1.00	1.00	1.03	1.03
35-35.9	1.02	1.02	1.02	1.05	1.02	1.05	1.02	1.02	1.02	1.05	1.05
36-36.9	1.04	1.04	1.04	1.07	1.04	1.07	1.04	1.04	1.04	1.07	1.07
37-37.9	1.06	1.06	....	1.09	1.06	1.09	....	1.06	....	1.09	1.09
38-38.9	1.08	1.08	....	1.11	1.08	1.11	....	1.08	....	1.11	1.11
39-39.9	1.10	1.10	....	1.13	1.10	1.13	....	1.10	....	1.13	1.13
40 and above	1.12	1.12	....	1.15	1.12	1.15	....	1.12	....	1.15	1.15

NORTH TEXAS, WEST CENTRAL TEXAS, EAST CENTRAL TEXAS GRAVITY TABLES

	1	2	3	4	5	6	7	8
Below 20	....	....	....	....	$.80	....	....	
20-20.9	....	....	....	....	.82	....	....	
Below 21	....	....	....	....	....	$.81	....	....
21-21.9	....	....	....	....	.84	.83	....	
22-22.9	....	....	....	....	.86	.85	....	
23-23.9	....	....	....	....	.88	.87	....	
24-24.9	....	....	....	....	.90	.89	....	
Below 25	....	....	$.88	....	....	....	$.89	$.95
25-25.9	$.91	....	.90	$.97	.92	.91	.91	.97
26-26.9	.93	....	.92	.99	....	.93	.93	.99
27-27.9	.95	....	.94	1.01	....	.95	.95	1.01
28-28.9	.97	.97	.96	1.03	....	.97	.97	1.03
29-29.9	.99	.99	.98	1.05	....	.99	.99	1.05
30-30.9	1.01	1.01	1.00	1.07	....	1.01	1.01	1.07
31-31.9	1.03	1.03	1.02	1.09	....	1.03	1.03	1.09
32-32.9	1.05	1.05	1.04	1.11	....	1.05	1.05	1.11
33-33.9	1.07	1.07	1.06	1.13	....	1.07	1.07	1.13
34-34.9	1.09	1.09	1.08	1.15	....	1.09	1.09	1.15
35-35.9	1.11	1.11	1.10	1.17	....	1.11	1.11	1.17
36-36.9	1.13	1.13	1.12	1.19	....	1.13	1.13	1.19
37-37.9	1.15	1.15	1.14	1.21	....	1.15	1.15	1.21
38-38.9	1.17	1.17	1.16	1.23	....	1.17	1.17	1.23
39-39.9	1.19	1.19	1.18	1.25	....	1.19	1.19	1.25
40 and above	1.21	1.21	1.20	1.27	....	1.21	1.21	1.27

NORTH TEXAS, WEST CENTRAL TEXAS, EAST CENTRAL TEXAS TABLE EXPLANATION

COLUMN (1) WEST CENTRAL AND NORTH:
Humble Oil & Refining Co., 12-11-41, includes Brown, Callahan, Comanche, Eastland, Fisher, Haskell, Jones, Shackelford, Stephens, and Throckmorton counties.

Panhandle Refining Co., 12-11-41, in Leuders area.

Gulf Refining Co., 12-11-41.

Sinclair Prairie Oil Marketing Co., 12-11-41.

COLUMN (2) NORTH TEXAS:
Continental Oil Co., 12-11-41.
Magnolia Petroleum Co., 12-11-41.
Panhandle Refining Co., 12-11-41.
Bell Oil & Gas Co., 12-11-41.
Texas Co., 12-11-41.

COLUMN (3) EAST CENTRAL:
Magnolia Petroleum Co., 5-21-41, includes Cass, Panola, and Rodessa (Texas and Louisiana), and Miller County, Arkansas.

(Continued on Page 79)

STANDARD OIL CO. OF CALIFORNIA

CRUDE-OIL PRICES EFFECTIVE MAY 23, 1941

(All gravities above those quoted take highest price offered in that field)

Gravity	Signal Hill (Long Beach)	Wilmington	El Segundo	Seal Beach	Huntington Beach	Inglewood	Playa Del Rey	Olinda-Brea Canyon	Athens-Rosecrans	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	Greeley, Canal, Wasco	Coles Levee	Mountain View	Elk Hills, Buena Vista Hills, Midway-Sunset, Lakeview area	Lost Hills	Coalinga	Wheeler Ridge	Kettleman Hills	Elwood Terrace
14-14.9	....	$.68	....	....	$.71	....	....	$.70	....	$.70	$.70	$.70	$.72	....	....	....	....	....	$.73	$.73	$.73	....	....	....
15-15.9	....	.71	....	....	.75	$.76	....	.72	....	.72	.71	.72	.72	....	....	....	....	....	.73	.73	.73	....	....	....
16-16.9	....	.74	$.79	....	.79	.79	....	.75	....	.74	.73	.75	.72	....	....	....	....	....	.73	.73	.73	....	....	....
17-17.9	....	.78	.82	....	.82	.82	....	.78	....	.77	.76	.78	.72	....	....	....	....	....	.75	.78	.73	....	....	....
18-18.9	$.80	.82	.86	....	.86	.85	....	.81	....	.80	.79	.82	.74	....	....	....	....	....	.78	.81	.73	....	....	....
19-19.9	.84	.86	.90	....	.89	.88	....	.85	....	.83	.82	.85	.77	....	....	....	....	$.73	.81	.84	.75	....	....	....
20-20.9	.88	.90	.94	....	.93	.92	$.80	.88	....	.86	.85	.89	.80	....	....	....	....	.76	.85	.87	.77	....	....	....
21-21.9	.92	.94	.98	....	.96	.95	.84	.91	....	.89	.89	.92	.84	....	....	....	....	.79	.90	.90	.80	....	....	....
22-22.9	.96	.98	1.02	$.88	.99	.98	.87	.95	....	.93	.93	.96	.87	....	....	....	....	.83	.94	.93	.83	$.76	....	....
23-23.9	1.00	1.02	1.05	.92	1.02	1.01	....	.98	....	.97	.98	1.00	.91	....	....	....	....	.87	.99	.96	.86	.80	....	....
24-24.9	1.03	1.06	1.07	.97	1.05	1.04	f.o.b.	1.01	....	1.01	1.02	1.03	.94	$.99	....	....	....	.90	1.03	.99	.89	.83	....	....
25-25.9	1.07	1.09	1.10	1.01	1.08	1.07	our	1.04	....	1.05	1.06	1.07	.98	1.02	....	....	....	.94	1.07	1.01	.92	....	....	....
26-26.9	1.11	1.12	1.12	1.06	1.11	1.10	pipe	1.08	....	1.09	1.10	1.11	1.01	1.06	....	....	....	.97	1.11	1.04	.95	....	....	....
27-27.9	1.15	1.15	1.15	1.10	1.14	1.14	line	1.11	....	1.13	....	1.15	1.05	1.10	$1.04	....	....	1.01	1.15	1.07	.98	....	....	....
28-28.9	1.18	1.18	1.18	1.15	1.17	1.17	....	1.14	....	1.17	....	....	1.08	1.13	1.08	....	....	1.04	1.19	1.10	1.00	....	....	....
29-29.9	1.20	1.21	....	1.19	1.20	1.20	....	....	$1.17	....	....	....	1.12	1.17	1.12	....	....	1.07	1.24	1.13	1.02	....	....	....
30-30.9	1.23	1.24	....	....	1.23	1.22	....	....	1.21	....	....	....	1.15	1.21	1.15	$1.01	$1.09	1.10	1.28	1.16	1.04	....	....	f.o.b.
31-31.9	....	....	....	....	....	1.24	....	....	1.25	....	....	....	1.19	1.24	1.19	1.04	1.12	1.14	....	....	1.06	....	....	ship
32-32.9	....	....	....	....	....	....	....	....	1.29	....	....	....	1.23	1.28	1.23	1.07	1.14	1.17	....	....	1.09	....	....	....
33-33.9	....	....	....	....	....	....	....	....	1.32	....	....	....	1.27	....	1.26	1.10	1.17	....	....	....	1.11	....	....	$1.22
34-34.9	....	....	....	....	....	....	....	....	1.36	....	....	....	1.31	....	1.30	1.13	1.20	....	....	....	1.13	....	....	1.25
35-35.9	....	....	....	....	....	....	....	....	....	....	....	....	1.35	....	....	1.16	1.22	....	....	....	....	....	$1.23	1.28
36-36.9	....	....	....	....	....	....	....	....	....	....	....	....	1.39	....	....	1.19	1.25	....	....	....	....	....	1.26	....
37-37.9	....	....	....	....	....	....	....	....	....	....	....	....	1.43	....	....	1.22	....	....	....	....	....	....	1.29	....
38-38.9	....	....	....	....	....	....	....	....	....	....	....	....	1.47	....	....	1.25	....	....	....	....	....	....	....	....
39-39.9	....	....	....	....	....	....	....	....	....	....	....	....	1.51	....	....	....	....	....	....	....	....	....	....	....
40-40.9	....	....	....	....	....	....	....	....	....	....	....	....	1.53	....	....	....	....	....	....	....	....	....	....	....

Standard posts 73 cents for all grades at Newhall, Kern River, Kern Front, McKittrick and Round Mountain.

Personal Paragraphs

H. W. FISHER, manager of the commercial department of Standard Oil Development Co. since 1936, and a vice president of Standard Alcohol Co. for the past 4 years, has been appointed head of the newly organized chemical-products division of Standard Oil Co. of New Jersey (Delaware). Mr. Fisher has been with Standard since 1927, when he was employed in the Louisiana research laboratory. In 1929 he went to Bayway, in 1933 to New York as assistant manager of sales engineering, and in 1935 was made assistant director of the Bayway laboratories.

ROY L. JOHNSON, attorney for Cities Service Oil Co., Bartlesville, Okla., has been elected president of the Washington County Bar Association.

RAY W. DIMIT, formerly a petroleum engineer for Shell Oil Co., Inc., at Wichita Falls, Tex., has enlisted in the U. S. Naval Reserve, and is located in New York City.

G. S. TAITT has recently returned from Trinidad and has been assigned by Shell Oil Co., Inc., to the San Joaquin division and will make Bakersfield, Calif., his headquarters.

A. H. BURGESS, district manager of the Oklahoma Natural Gas Co.'s Stillwater, Okla., district, has been transferred to Ardmore, Okla., to assume the duties of business manager.

JOHN GALLOWAY, vice president of Standard Oil Co. of British Columbia, who has been in charge of the company's development program in Alberta, has been elected a director of the Alberta Petroleum Association.

M. H. DUFFIELD, veteran employe of Mid-Continent Petroleum Corp., Tulsa, has been named assistant to T. E. FITZGERALD, assistant general sales manager, succeeding J. D. CURTIN, who recently resigned. Mr. Duffield began his association with the company in 1920.

THOMAS W. SIMMONS, president of Bolsa Chica Oil Co., general manager of Bass Foundry & Machine Division of National Industries, Inc., of Fort Wayne, Ind., is one of a group of business men attending a 4-week orientation course in organization at the general staff school at Fort Leavenworth, Kansas, which began October 26.

ALLISON L. TULL, FRED W. MOSER and A. L. BARR have been elected directors of Jolla Petroleum Co., which has taken acreage near Rose Canyon, north of San Diego, Calif., where a wildcat well will be drilled in the near future.

JAMES W. (CAPTAIN) FLANAGAN, president of Andian Corp. of Toronto, Ont., since 1925, has retired from the company but will remain active on a government assignment in Washington, D. C. Captain Flanagan, who was recently made an honorary lieutenant colonel of the Irish Regiment of Canada, was instrumental in the organization of Andian, which built the 335-mile Colombia pipe line from the Barranca-Bermeja area to the port of Cartagena.

W. K. WHITEFORD, of Toronto, Canada, executive vice president of British-American Oil Co., recently inspected in Calgary, Alberta and vicinity. HENRY C. REA has been placed in charge of the company's geological department at Calgary.

GEORGE H. McCARTHY, formerly associated with the Sunset Oil Co. of California, has been named general manager of Franco Oils and Vermilion Consolidated Oils, with headquarters at Vermilion, Alta.

FRANK E. MOTT, assistant to W. C. TEAGLE, chairman of the board of Standard Oil Co. (New Jersey), for the past 21 years, has been commissioned a lieutenant colonel in the U. S. Army Ordnance Department, and has been granted a leave of absence. Next May will mark the fortieth year since he began his service with Standard of New Jersey.

WILLIAM B. WILSON, chief geologist, Gulf Oil Corp., Tulsa, addressed the Tulsa Geological Society this week on "The Role of Geology in the Second World War."

RUSSELL V. JOHNSON, consulting geologist, has returned to Calgary, Alta., from the Gaspe Peninsula, where he located wells for Continental Petroleums, of Montreal.

JOHN DERRYBERRY, oil man of DeRidder, La., left last week to report for duty in the U. S. Naval Reserve. He is stationed at Davisville, R. I., as boatswain's mate first class.

OSCAR E. WAGNER, JR., has resigned as district geologist with the Texas Co. at Wheeling, W. Va., and has accepted a position as district geologist for Illinois and Indiana with Mid-Continent Petroleum Corp.

P. McDONALD BIDDISON, chief consulting engineer of Lone Star Gas Co., Dallas, Tex., has been given leave of absence to become chief engineer of the gas transportation division of War Production Board at Washington, D. C.

ROSS B. CHAMBERS, who has been drilling foreman for Shell Oil Co., Inc., for some time at Ventura, Calif., has been promoted to division drilling foreman for the Los Angeles Basin Division and will maintain headquarters at the company's Los Angeles office as well as at Long Beach, Calif.

JOHN G. CREGO, veteran employe with Cities Service Oil Co., Bartlesville, Okla., has been transferred to New York City, where he will become associated with Petroleum Advisers, Inc. When he left, he was in the original costs department, although he had also served in the oil production and land lease divisions.

Do You Remember?

From The Oil and Gas Journal Files

35 YEARS AGO (1907)

All stations on the Gulf Pipe Line Co.'s Territory-to-the-Gulf trunk line are now running full time, and the deliveries are averaging 13,500 bbl. a day. Lufkin, the last station to be got going, started October 22.

Completions in the Mid-Continent field in October numbered 392, of which 363 were producers, with an initial output estimated at 62,790 bbl., or 173 bbl. per well.

Prairie Oil & Gas Co. has built a loading rack at Muskogee, Okla., and the first shipment by rail went out from that point on October 24, to Beaumont, Tex. It consisted of about 1,200 bbl.

25 YEARS AGO (1917)

Refiners in the East are reported to be unwilling to book contracts for future delivery, because all of them are afraid of some disturbance in prices by the Government.

There are no pipe lines from Rumania to Germany and the civil population of the Central Powers is suffering more from lack of oil than at any period in the history of the war.

John R. Manion, general superintendent of the Sinclair-Cudahy Pipe Line Co., says that the 8-in. line which the company is laying between Humboldt, Kans., and Whiting, Ind., has been connected and is in operation as far north as Fort Madison.

15 YEARS AGO (1927)

Oil has been struck near Kirkuk, Iraq, and reports are that the flow of the well is 50,000 bbl. per day. Turkish Petroleum Co. drilled the well, which is directly north of Bagdad and southeast of Mosul.

The Burbank field has been rather inactive for more than a year, but the completion of good wells on the east side of the pool has revived the interest which was formerly manifested in this highly productive region of Oklahoma.

Some of the most perplexing problems of oil-field operation are to be subjected to a practical test at the experimental station of the Bureau of Mines at Bartlesville, Okla.

R. E. ARRANT, formerly of Houston, Tex., is now district manager for Sinclair Refining Co., with office in Columbus, Tex.

THOMAS E. LEVI, petroleum engineer of Houston, Tex., who entered war service some months ago, is stationed somewhere in England.

W. F. HUFF, formerly director of the Materials Division, Office of Petroleum Coordinator, and more recently a special assistant to the deputy coordinator, has resigned from the government oil agency. He has returned to California where, previous to joining OPC, he was engaged in the petroleum-equipment industry.

DR. HAROLD GERSHINOWITZ, of the Houston, Tex., refinery of Shell Oil Co., Inc., has been transferred to the New York office, and is succeeded by M. P. L. LOVE as head of the research laboratory, who comes to the Houston refinery from New York.

WRIGHT W. GARY, president of Filtrol Corp.; ALEXANDER MACDONALD, deputy regional director WPB, and DR. HOOPER LINFORD, research chemist for Union Oil Co., will be the speakers at the 1942 fall meeting of the California Natural Gasoline Association to be held early in November.

R. V. BEHOUT, drilling contractor of Fort Worth, Tex., has accepted a position in Bolivia, South America, as drilling superintendent for the government-owned Yacimientos Petroliferos Fiscales Bolivianos. The Brazilian Government has acquired two rotaries and four large spudders for its drilling operations. A topping plant also will be constructed there for refining the crude into gasoline and diesel fuels for the speeding up of mining operations. Mr. Behout went to Texas in 1918, and has worked in Ranger, Breckenridge, and West Texas districts.

Pan-American Oil Man

Pan-American oil man is C. B. Williams, manager of the West Texas division producing department of The Texas Co. at Fort Worth, Tex. Mr. Williams, a native of Texas, born at McDade, started in the oil business at Tampico, Mexico, in 1919 as a petroleum engineer for The Texas Co. He was just out of the Army where he had served as a first lieutenant in air-service ground-school training at the School of Military Aeronautics at Austin, Tex., and at Washington, D. C.

C. B. WILLIAMS

In 1916 Mr. Williams had been graduated in electrical engineering by University of Texas and for a year after graduation, worked in plants of General Electric Co. in Pittsfield, Mass., and Schenectady, N. Y.

After 4 years in Mexico with Texas Co., he moved to the West Texas division of the company and worked in and around Cisco as engineer, production foreman, and in other capacities until 1929 when he came to Fort Worth as assistant division manager.

He was made manager of Colombian Petroleum Co., jointly owned by The Texas Co. and Socony-Vacuum Oil Co., Inc., in January 1938, and was stationed at Cucuta, Colombia, in charge of development of the Barco concession until January 1941. At that time he returned to the United States and became assistant to the manager of the producing deparment of The Texas Co. at Houston. In November of the same year, he succeeded H. S. Cole, Jr., in the position he now holds.

Mr. Williams is married and has two daughters, one of whom is a graduate of University of Texas.

W. W. VIETTI has returned from Colombia, where he was manager of Colombian Petroleum Co., and is now with Texas Co. in Houston, Tex.

DEWEY J. SABIN, formerly general superintendent of Hamilton Gas Corp., and Southeastern Gas Co., Charleston, W. Va., has accepted a new position as general superintendent of Jefferson County Gas Co., Brookville, Pa.

G. L. BRENNAN, manager of the liquefied gas division of Warren Petroleum Corp., Tulsa, addressed the Engineers Club of Tulsa this week. His talk covered the transportation, storage, and utilization of butane and propane.

JOHN H. HERSHEY, who is associated with his father, JAMES H. HERSHEY in the Comet Drilling Co., Ellinwood, Kans., has reported to Randolph Field for service in the Army Air Corps. He is a 1941 graduate of University of Oklahoma.

G. H. WHITE, who has been identified with the exploration and production activities of Shell Oil Co., Inc., for the past 16 years, has been appointed assistant exploration manager of the Texas Gulf area, succeeding W. H. HAMM, who resigned.

E. W. HAMILTON, of Culham Petroleum Co., Tulsa, is now a captain in the Army, stationed at Camp Claiborne, Louisiana. Captain Hamilton, with his partner, S. J. CULLINAN, opened the Guthrie pool at Guthrie, Okla., in February 1941.

PHIL T. WILLIAMS, of Gaseteria, Inc., and vice president and director of the Indiana Independent Petroleum Association, has been appointed a member of the marketing committee of District 2, to succeed CAPT. RUSSELL S. WILLIAMS, who resigned to enter military service.

JAMES ANDERSON, former vice president and treasurer of Humble Oil & Refining Co., Houston, Tex., has received a commission in the Army as lieutenant colonel. He has been assigned to duty in Houston as procurement officer. In this capacity he will go into the possibilities of highly trained civilians for specialized work in the Army.

S. J. MODZIKOWSKI, chemical engineer for Peoples Gas, Light & Coke Co., Chicago, Ill., has been elected commander of the Peoples Gas Post of the American Legion. Mr. Modzikowski was formerly active in American Gas Association work, having served as chairman of the chemical committee and vice chairman of the technical section for a number of years.

P. G. ANDERSON, traffic manager for Lion Oil Refining Co., has been granted a leave of absence to go to Washington, D. C., to serve in the OPC transportation division. He will serve directly under MAJ. J. R. PARTEN. Before leaving El Dorado, Ark., Mr. Anderson was guest of honor at a sendoff banquet. FORD MAGGARD will be acting traffic manager during the absence of Mr. Anderson.

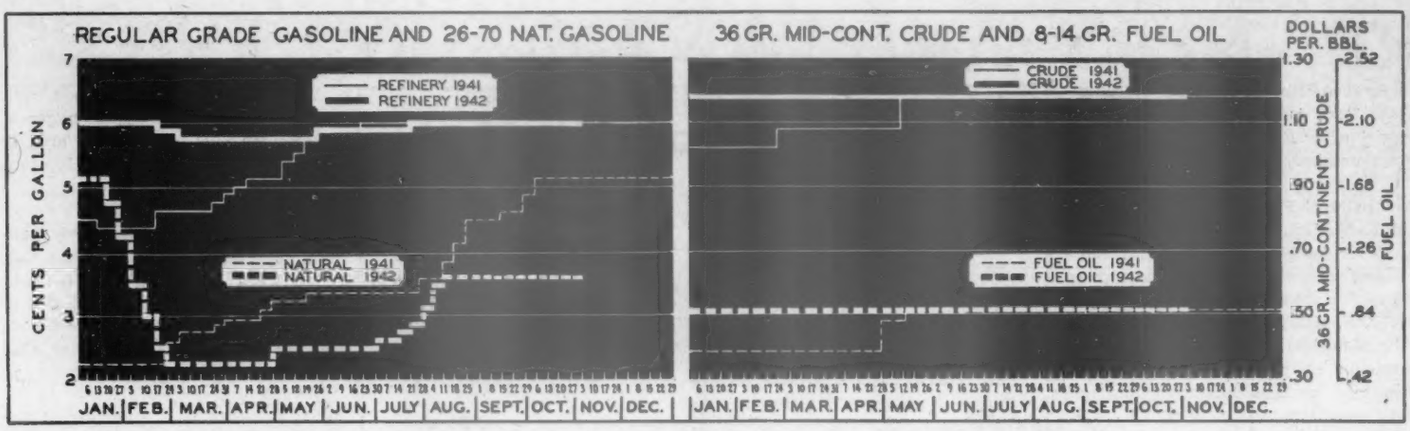
JOE M. ALEXANDER has returned from South America, where he was with International Petroleum Co., Negritos, Peru. He is now addressed at Roshacon, Tex.

Shifts: ROBERT S. COOKE, engineer, Carter Oil Co., Great Bend, Kans., to Tulsa; ROBERT F. HARTMAN, engineer, Standard Oil Co. of California, Berkeley to Santa Monica, Calif.; R. E. KEEN, engineer, British American Oil Producing Co., Arp to Selman City, Tex.; F. C. HASTERT, engineer, Phillips Petroleum Co., Valley to Omaha, Neb.

JOHN R. SUMAN, vice president, Humble Oil & Refining Co., Houston, Tex., keynoted the dedication exercises at the ceremonies attendant to the opening of the new petroleum building at University of Texas. DR. E. DeGOLYER, assistant deputy coordinator, OPC, and FRANK BUTTRAM, president, Independent Petroleum Association of America, were other speakers.

MAJ. GEN. WILLIAM S. KEY, in civil life an oil operator in Texas and Oklahoma fields, now commanding an infantry division, has been selected to be provost marshal general in the European theater, serving on Lt. Gen. Dwight D. Eisenhower's staff as advisor on matters pertaining to the relations between United States soldiers and the British civil and military authorities.

JAMES W. GALLAGHER has returned to the United States to join the Army. He has been commissioned a second lieutenant and is stationed at Camp Claiborne, Louisiana. He has been in Caripito, Venezuela, since December 1941, with Standard Oil Co. of Venezuela. For 2 years prior to that he was with Standard Oil Co. of Egypt, at Cairo. Before entering foreign service he handled material for Carter Oil Co. at St. Elmo, Ill., Ardmore, Okla., and Tulsa.



MARKET DEVELOPMENTS . . .

East Coast

NEW YORK.—The expanding deficit in tank-car shipments into District 1 is causing increased alarm and some elements in the industry are reported to be urging stricter rationing regulations, particularly for gasoline. The comparatively good condition of gasoline, especially in the New York metropolitan area, is attested by the fact that the market is reported to be somewhat softer than it has been. This could have been caused by a fairly good supply situation in relation to current demand.

Latest available figures on tank-car shipments covering the week ended October 24 reveal that shipments continue well below the expected level on which the latest economics committee recommendations were based. It is estimated that total shipments for the month up to October 24 were 18,850,000 bbl. Had these shipments reached their expected level, they would have aggregated 21,600,000 bbl. Thus they have been 2,750,000 bbl. short of the goal, a shortage of almost 13 per cent. This shortage is equivalent to 2 full days' of District 1 essential demand for all products.

Since there have been no protracted cold spells in the more populous East Coast areas, no hardship has yet resulted but difficulties are expected when a sustained period of cold weather arrives. In view of the certain difficulty in meeting fuel-oil requirements and the curtailed tank-car shipments, many companies are in favor of more stringent gasoline rationing. With OPA engaged in preparing for nation-wide rationing, it is doubtful if any such action will be taken in the near future despite the apparent immediate need for it.

Mid-Continent

INQUIRIES for refinery products for November delivery opened the week at a brisk pace continuing the general aspect of market conditions prevalent for more than a month. Buyers were still interested in motor gasoline although refiners are inclined to discount present market factors in appraising end-of-the-month prospects. The continued interest of buyers, however, confirms other indications that voluntary mileage rationing has absorbed much of the shock which would have otherwise occurred along with direct consumer curtailment.

Particular interest currently is centered on all grades of burning oil. The specific price ceilings on residual fuel oil established by the Office of Price Administration, effective November 4, are lower than current spot-market quotations. However, movement of heavy fuels has been confined almost exclusively to contracts for several months and the OPA action is not, therefore, as important to the general market as it would have been if applied to products more freely traded. The OPA set a ceiling of 80 cents per barrel f.o.b. refinery on No. 6 fuel oil sold in Oklahoma and in the North Louisiana-Arkansas refining district. Spot quotations had ranged from 85 to 90 cents but few sellers were in position to make open-market delivery.

Manufacturers of natural gasoline reported this week that demand continues to exceed supplies. The market was said to be exceedingly tight at unchanged prices. Manufacturers are hesitant in asking higher prices, realizing that current quotations are in reasonable balance with other motor fuels and that higher costs to the refiners would tend to discourage blending operations.

SENTENCE SUMMARIES

MID-CONTINENT: Demand for all products is brisk. Ceiling price on residual fuel set below spot quotations. Prices steady.

GULF COAST: Quotations withdrawn on several light burning oils. Higher octane values add 0.2 cent per gallon to refinery cost.

EAST COAST: Slight softening in gasoline-price tone indicates supply position is improved. Lower rail movement concerns fuel suppliers.

PACIFIC COAST: Fuel-oil stocks rising, gasoline moving at low range of price quotations. Hot crude reported weakening market.

PENNSYLVANIA: Refiners moving substantial quantities of lubricating oils. Fuels in strong demand, gasoline steady.

A.P.I. REFINERY REPORT

Week Ended October 24, 1942

(Figures in thousands of barrels)

	Dly. crude runs to stills	Stocks: Gasoline	Stocks: Residual	Stocks: Gas oil
Appalachian	162	2,705	503	728
Ind., Ill., Ky.	773	13,826	3,137	6,168
Okla., Kans., Mo.	356	6,412	1,388	1,851
Censored group*	1,650	38,150	19,035	25,575
Rockies	109	1,642	570	429
California	726	16,810	54,440	12,816
Total Oct. 24, 1942	3,776	79,545	79,073	47,567
Total Oct. 17, 1942	3,709	78,956	78,537	46,926
Total Oct. 25, 1941	4,071	82,390	94,339	54,946

Note: Refinery runs and stocks for week ended October 31, 1942, appear on Trends page.

*Reports combined on East Coast, Gulf Coast, North Louisiana-Arkansas and Inland Texas at request of OPC.

CRUDE-OIL STOCKS

(Bureau of Mines Estimate)

Week ended:	Bbl. of crude*
October 24, 1942	237,986,000
October 17, 1942	238,118,000
October 25, 1941	242,261,000

*Excludes heavy, unrefinable crude in California.

Gulf Coast

HOUSTON, Tex.—Strong demand continued to mark the Gulf Coast refinery market, with scarcity of material pronounced in several groups of products. Prices which have prevailed throughout the list for several months remained unchanged. Some marketers are not quoting at all on kerosene, heavy fuel, and No. 3 domestic burning oil. They cannot obtain these products under the ceiling prices which have been established, with the result that they would be able to handle the material only at a loss.

Refiners are saying little regarding the War Department's request that they increase the minimum antiknock rating of their Ethyl Gasoline from 78 octane to 80. It is estimated that the change in antiknock ratings will add about 0.2 cent per gallon to the cost of gasoline at the refinery, and it is not expected that this increase can be passed on to the consumer. Predictions are made by some Gulf Coast refiners that after the close of the year only two grades of motor fuel will be handled by retailers, 72-octane for the civilian driver and 80-octane for Army purposes.

Pacific Coast

LOS ANGELES, Calif.—Most motor-fuel movement this week has been in the low brackets and then in only limited quantities. Reports of hot oil reaching refiners will, if true, tend to keep gasoline prices under pressure. Sales, as is customary, will begin to show declines incident to the winter season.

For the first time in over 2 years, fuel-oil stocks are showing a substantial increase. Over 2,000,000 bbl. were added to stocks during September. This was offset to some extent by a reduction in heavy crude stocks of 635,000 bbl. and a decline in light refinable oil stocks of 1,200,000 bbl. This trend represents a change in operating conditions in the various refineries plus the probability that marine deliveries were below normal.

Production of gas oil and diesel is high and, in September, resulted in the addition to stocks of 546,000 bbl. Demand for gas oil has been high for several months as blending stock for improving fuel oil to Navy specifications.

Natural gasoline has been withdrawn from storage for several months but there is no apparent shortage. Highest demand is expected early in 1943.

REFINERY AND TANK-WAGON PRICES

(Prices as of November 3)

Refinery Gasoline

Octane (A.S.T.M.):	†80	78	74.76	72-74	68-70	63-66	60 & lower
Mid-Continent*	.....	.....	.....	5.875-6.000	.....	5.500-5.625	5.125-5.250
Pennsylvania	.....	.....	6.750-7.000	.....	.....	.....	.....
Gulf Coast‡	6.00-6.50	.....	.....	‖5.750-6.250	‖5.750-6.250	‖5.250-5.750	‖5.000-5.500
Northeast Coast	9.80	.....	.....	9.2	9.2	.....	.....
Pacific Coast	.....	6.500-7.000	6.250-6.500	6.125-6.250	5.750-6.000	5.125-5.250	4.750-5.000

*Basis Group 3. †1939 C.F.R. (research method). ‡Integrated companies restricted to lowest prices. ‖Unleaded.

Quotations are f.o.b. plant in cars and in cents per gallon except where otherwise noted. They are exclusive of the federal excise taxes of 1.5 cents a gallon on gasoline and 4.5 cents a gallon lubricating oils, and do not include marine lighterage charges.

Natural Gasoline

Grades:	26-70	18-55	75-85(350-375)
Oklahoma (Group 3)	3.625	4.350	.....
North Texas	3.250	3.900	.....
North Louisiana	3.375	4.050	.....
California	.....	.....	4.875-5.500

Kerosene and No. 1 Fuel Oil

Gravity:	46	45	42-44	41-43	38-40
Mid-Continent*	.....	.....	4.500	4.375	.....
North Louisiana	.....	.....	.....	4.500-4.750	.....
Pennsylvania	6.250-6.625	6.125-6.250	.....	.....	.....
California	.....	.....	.....	4.500-5.500	4.250
Northeast Coast	.....	.....	.....	6.80	.....
Gulf Coast	.....	.....	.....	3.875	.....

*Basis Oklahoma Group 3.

Tractor, Diesel, and Bunker Fuel Oil

Specifications:	46-48° G.	24 D.I.	48-52 D.I.	58 & above	Diesel bunkers	Bunker C
Mid-Continent*	4.125	.....	.....	.....	.....	.....
California	.....	2.750-4.000	.....	.....	‡$1.35-1.45	$0.85-0.90
Gulf Coast	.....	.....	4.000	4.125	1.45	0.85
Northeast Coast	.....	.....	.....	6.800	2.780	1.65
North Louisiana	.....	.....	.....	.....	.....	†0.80-0.85

*Basis Oklahoma Group 3. †10-14° gravity. ‡Pacific Specification 200.

Furnace Oil, Gas Oil, Fuel Oil

	No. 2	No. 3	No. 5	No. 6
Mid-Continent*	3.625-3.750	3.500-3.625	$0.85	$0.80
Pennsylvania (West)	5.875-6.125	5.875-6.000	†5.250-5.500	.....
Northeast Coast	6.7	6.7	1.95	1.65
Pacific Coast	5.5	5.5	‡0.80-95	$0.80
Gulf Coast	3.875-40	.....	1.65	0.85

*Basis Oklahoma Group 3. †36-40 gravity fuel oil. ‡Pacific Specification 300. ‖Pacific Specification 400.

Lubricating Oils

Bright and Steam Refined

OKLAHOMA (Group 3)—

200-210 D, 10-25	27.00
150-160 D, 0-10	23.00
120-125 D, 0-10	22.00
Steam refined:	
600 dark green (untreated)	9.00 9.50

PENNSYLVANIA—

Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pour point		30.50
15 pour point		29.50
25 pour point	25.00	28.00
Steam refined:		
600	15.00	16.00
650	15.50	16.50
600 flash	16.00	17.50
630 flash	17.00	17.50

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—

0-10 pour point:	
200-3	15.00
300-3	18.00
500-3	19.50
600-3	20.00

Note: Viscous neutrals, 10-25 pour, quoted 0.5 cent under 0-10 oils.

Wax

(Cents per pound)

OKLAHOMA (Group 3)—	
124-126 (A.m.p.) w.c. scale	4.250
PENNSYLVANIA (inland refineries)—	
122-124 (A.m.p.) w.c. scale	4.250
124-126 (A.m.p.) w.c. scale	4.250

Neutral Oil

CALIFORNIA—

Pale oils:		
200-2¼-3	7.00	7.75
400-3-4	7.25	8.00
600-3-4	8.75	11.00
Red oils:		
200-4-5	7.00	7.75
400-5-6	9.00	11.00
500-900, 5-6½	9.25	11.25

GULF COAST—

Pale oils:		
200-3	8.50	8.75
300-3	9.00	9.25
500-3½	9.75	10.00
750-3½	10.00	10.25
2,000-4	10.50	10.75
3,000-4	12.25	12.50

PENNSYLVANIA—

150 vis. at 70° F., 3 color, 400-405 flash:	
Zero pour point	37.50
10 pour point	36.50
15 pour point	35.50
25 pour point	30.00
200 vis. at 70° F., 3 color:	
Zero pour point	39.50
10 pour point	38.50
15 pour point	37.50
25 pour point	32.00

NEW YORK—

Wax in bags fully refined:	
130-132 (A.m.p.) wax	5.850
133-135 (A.m.p.) wax	6.150
Crude scale:	
124-126 (A.m.p.) w.s.	4.250
124-126 (A.m.p.) y.s.	4.250

EXPORT PRICES

Gasoline—60-62° Gravity, Maximum 400 End Point

Octane:	72-74	68-70	65-66	60
Gulf Coast	6.050	6.250-6.500	5.875	5.625
Pacific Coast	.....	6.125-6.500	5.875-6.000	5.500-5.625

Distillate and Fuel Oil

	Kerosene	Diesel fuel				Bunker
	41-43	24 G.	48-52 D.I.	58 D.I.	Bunkers	C grade
Gulf Coast	4.000-4.250	.....	4.125-4.375	4.375	$1.65-80	$0.85-95
Pacific Coast	4.750-5.000	1.25-30	.....	.....	†1.35-45	*0.80-90

*Pacific Specification 400. †Pacific Specification 200.

Lubricating Oils

	Neutral oils		Bright and cylinder stocks		
	200-3	150-3	200-3	150-3	600&630 S.R.
Mid-Continent	16.8	.....	28.8	24.8	.....
Pennsylvania	43-50	41-46	36-37	36-37	26.5-27

GASOLINE AND KEROSENE TANK-WAGON PRICES IN 50 CITIES

(Gasoline prices based on regular grades, tax included, undivided dealer)

ATLANTIC AND NEW ENGLAND

(Socony-Vacuum Oil Co., Inc., and Atlantic Refining Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Baltimore, Md.	15.45	5.50	10.20
Boston, Mass.	14.90	4.50	9.50
Burlington, Vt.	16.90	5.50	.....
Buffalo, N. Y.	16.20	5.50	10.30
Dover, Del.	16.70	5.50	11.20
Hartford, Conn.	15.60	4.50	.....
Manchester, N. H.	17.30	5.50	10.50
Newark, N. J.	14.70	4.50	9.40
New York, N. Y.	16.10	5.50	9.50
Philadelphia, Pa.	16.20	5.50	11.65
Pittsburgh, Pa.	16.70	5.50	12.00
Portland, Me.	16.30	5.50	9.60
Providence, R. I.	15.00	4.50	9.30
Washington, D. C.	14.70	3.50	10.70
Average 14 cities	15.91	5.07	10.32

(All prices undivided dealer basis.)

CENTRAL

(Standard Oil Co. of Indiana, Standard Oil Co. of Ohio, Continental Oil Co. and Texas Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Chicago, Ill.	13.40	4.50	10.30
Cleveland, Ohio	15.00	5.50	*9.00
Dallas, Tex.	13.00	5.50	7.00
Des Moines, Iowa	14.40	4.50	9.80
Detroit, Mich.	14.40	4.50	9.60
Fargo, N. D.	16.90	5.50	11.30
Huron, S. D.	16.30	5.50	10.70
Indianapolis, Ind.	15.20	5.50	9.80
Little Rock, Ark.	17.50	8.00	10.00
Milwaukee, Wis.	16.10	5.50	10.50
Minneapolis, Minn.	15.40	5.50	10.30
Omaha, Neb.	15.40	6.50	9.80
Tulsa, Okla.	16.50	7.00	8.50
Wichita, Kans.	12.70	4.50	8.00
Average 14 cities	15.15	5.57	9.61

*Includes 1-cent state tax.

SOUTHEASTERN

(Standard Oil Companies of New Jersey, Kentucky, and Louisiana)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Atlanta, Ga.	21.40	7.50	11.40
Birmingham, Ala.	18.50	8.50	9.00
Charleston, S. C.	18.45	7.50	.....
Charleston, W. Va.	18.75	7.50	13.00
Charlotte, N. C.	19.60	7.50	11.00
Jacksonville, Fla.	21.40	8.50	10.40
Jackson, Miss.	17.50	7.50	8.50
Louisville, Ky.	16.50	6.50	8.50
Memphis, Tenn.	18.60	8.50	10.50
New Orleans, La.	16.75	8.50	*10.00
Norfolk, Va.	16.95	6.50	13.50
Average 11 cities	18.58	7.59	10.58

*Includes 1-cent state tax.

MIDWESTERN

(Continental Oil Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Albuquerque, N. M.	17.50	7.50	10.00
Boise, Idaho	20.10	6.50	16.50
Casper, Wyo.	17.00	5.50	12.00
Denver, Colo.	14.50	5.50	11.00
Helena, Mont.	17.00	6.50	13.00
Phoenix, Ariz.	18.50	6.50	12.50
Reno, Nev.	17.50	5.50	13.50
Salt Lake, Utah	18.50	6.50	14.50
Average 8 cities	17.58	6.25	12.88

PACIFIC COAST

(Standard Oil Co. of California)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Portland, Ore.	17.00	6.50	13.50
San Francisco, Calif.	14.50	4.50	11.50
Seattle, Wash.	17.00	6.50	13.50
Average 3 cities	16.17	5.83	12.83
Average 50 cities	16.57	5.96	10.76
Average last week	16.57	5.96	10.76

CRUDE-OIL PRICES

(Continued from Page 75)

Gulf Refining Co., 5-21-41, includes Rodessa, Texas.

COLUMN (4) EAST CENTRAL:
Humble Oil & Refining Co., 5-21-41, includes Anderson, Cherokee, Limestone, and Navarro counties and the Navarro Crossing field.

COLUMN (5) EAST CENTRAL:
Humble Oil & Refining Co., 5-21-41, includes Hawkins field.

COLUMN (6) NORTH TEXAS:
Stanolind Oil Purchasing Co., 12-11-41.

COLUMN (7) FISHER COUNTY:
Shell Oil Co., Inc., 12-11-41.

COLUMN (8) MEXIA:
Sinclair Prairie Oil Marketing Co., 5-30-41.

TEXAS FLAT-PRICE FIELDS

Agua Dulce (light), Benavides, Longhorn, Southland, and Sweden, 5-21-41 ..... $1.35
Agua Dulce (heavy), 10-16-41 ..... $1.25
Republic Oil Refining Co., 5-21-41.

Alfred and Magnolia City $1.35
Continental Oil Co., 5-21-41.
Alice, Benavides (North Sweden), Ben Bolt, Clark-Mull, Sun, and Tom Graham $1.35
Humble Oil & Refining Co., 5-21-41.
Batson (new), Humble (35° and above), Fig Ridge, Hardin, Hull (25° and above), La Belle, North Dayton (25° and above), Seabreeze South China, West Orange, Willow Slough and Oyster Bayou ... $1.25
Sun Oil Co., 5-21-41.
Cass County $1.20
Texas Co., 5-21-41.
Cayuga, Anderson County $0.90
Pan American Production Co., 5-21-41.
Chapel Hill, Smith County:
Crude distillate $1.30
Crude oil 1.18
Chapel Hill Gas System, 11-7-41.
Clay Creek, Washington County ... $1.00
Sun Oil Co., 5-21-41.
Cleveland, Liberty County $1.26
Magnolia Petroleum Co., 5-21-41.
Conroe, Montgomery County ... $1.43
Humble Oil & Refining Co., 5-21-41.
Tide Water Associated Oil Co., 5-21-41.
Sun Oil Co., 5-21-41.
Texas Co., 5-21-41.

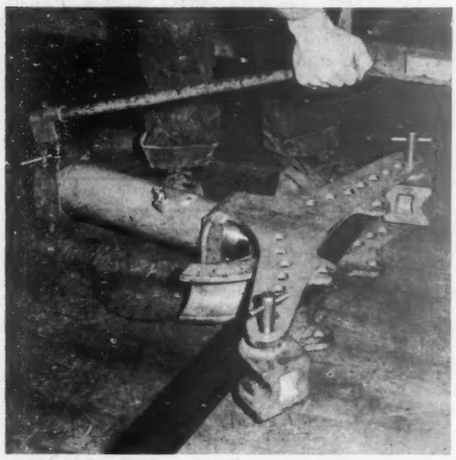
Cotton Lake (South) $1.35
Sun Oil Co., 5-21-41:
East Texas and Flag Lake* $1.25
**Humble Oil & Refining Co.*, 5-21-41.
Pan American Production Co., 5-21-41.
Tide Water Associated Oil Co., 5-21-41.
Gulf Refining Co., 5-21-41.
Magnolia Petroleum Co., 5-21-41.
Sinclair Prairie Oil Marketing, 5-21-41.
Shell Oil Co., Inc., 5-20-41.
Sun Oil Co., 5-21-41.
Texas Co., 5-21-41.
Stanolind Oil Purchasing Co.
Esperson (35° and above), South Esperson $1.30
Sun Oil Co., 5-21-41.
Flour Bluff, East Flour Bluff ... $1.33
Humble Oil & Refining Co., 5-21-41.
Hockley and Cochran $0.87
Texas Co., 5-21-41.
Livingston and Mercy $1.25
Shell Oil Co., Inc., 5-20-41.
Long Lake $1.23
Sinclair Prairie Oil Marketing, 5-21-41.
Luby $1.35
American Mineral Spirits Co., 5-21-41.
Luling $1.05
Magnolia Petroleum Co., 5-21-41.

Lytton Springs $1.17
Magnolia Petroleum Co., 5-21-41.
Salt Flat, North Salt Flat, Darst Creek*, Hilbig, Clark, Carroll, and Zoborski $1.14
Humble Oil & Refining Co., 5-21-41.
Magnolia Petroleum Co., 5-21-41.
**Texas Co.*, 5-21-41.
Rincon (North), Sun, North Sun and Garcia $1.35
Sun Oil Co., 5-21-41.
Yturria $1.45
Sun Oil Co., 3-19-42.
Talco $0.79
Humble Oil & Refining Co., 5-21-41.
Magnolia Petroleum Co., 5-21-41.
Tomball and Satsuma $1.40
Humble Oil & Refining Co., 5-21-41.
**Magnolia Petroleum Co.*, 5-21-41.
Stanolind Oil Purchasing Co., 4-1-41.
Van, Van Zandt County $1.08
Humble Oil & Refining Co., 5-21-41.
Pure Oil Co., 5-21-41.
Yates (regular) $0.98
Humble Oil & Refining Co., 5-21-41.
Gulf Refining Co., 5-21-41.
Shell Oil Co., Inc., 5-20-41.
Yates (shallow) $0.82
Shell Oil Co., Inc., 5-20-41.

EQUIPMENT PROGRESS...

Pipe-Bending Machine Produced By Holland Refugee

Tal's Prestal Bender, Inc., Milwaukee, Wis., announces a highly economical machine tool now manufactured by a refugee from Holland.



Tal's Prestal represents a new pipe-bending machine which actually produces smooth, even bends up to 180° on iron and steel bar and pipe without any kinks or wrinkles, in one single, simple operation, without moving the pipe. These outstanding features are due to the specific construction of the forming heads which are moved forward towards the pipe by the hydraulic piston of the machine, operated by a pump handle at the rear of the assembly.

Very handy in size (32 in. over-all length) and weighing only 98 lb. with the largest forming head, this machine can be set up in less than 1 minute at any place of installation or repair, without bolting, in the field, refinery, or plant.

In addition to pipe bending and bar bending, the unit can be applied to pressing and pushing work, wherever the energy of its powerful little pump may be required.

Reducing the use of fittings and elbows to a minimum, together with the time and skilled labor involved in their installation, as well as the annoyances they cause in operation, such as leaky joints, etc., this new device is in successful operation for varied uses in many great oil and gas concerns of the country

Leeds & Northrup Awarded Honors for War Production

The Army-Navy "E" Award, for work "well done" in production of war material, recently was made to the Leeds & Northrup Co., Philadelphia, Pa. C. S. Redding, president, explained that the activities which led to the award consist of maintaining a many-fold increase in production of the company's regular lines of measuring instruments, telemeters, automatic controls and heat-treating furnaces, and superimposing on that production the manufacture of a large amount of classified material for the armed forces.

Admiral Henry A. Wiley, retired, in making the award, said that the recommendations on which the award was based "could not have been higher."

In addition to Mr. Redding, other spokesman for the company were J. L. Johnson, president of the L. & N. Employes' Association, and W. F. Smith, president of the L. & N. Cooperative Association.

William L. Batt, president, SKF Industries, and vice chairman War Production Board, spoke of the pleasure in seeing outstanding production achivements recognized by the Army-Navy Award.

A ceremony which all workers could participate in, rather than merely attend, was arranged by a committee headed by L. R. Garretson, advertising manager. A highlight was the presentation of "E" pins to 12 employes, selected as "token" recipients for the entire organization.

Foote Bros. Gear & Machine Corp. Announces Promotions

Foote Bros. Gear & Machine Corp., Chicago, announced the election of Russell G. Davis to the vice presidency of that company at a recent meeting of the board of directors. Mr. Davis will continue in his capacity of general manager of the industrial gear division.

In line with the recently vastly increased business of this company, a number of promotions are announced in the sales department. F. A. Emmons is now assistant general manager; R. B. Moir is manager, sales and engineering; W. H. Ostring, special representative; Galen Butterbaugh, speed reducer sales; T. F. Hill, gear sales; Charles Look, assistant gear sales.

BUSINESS NOTES

H. B. (Brick) Dennis, representative for Darling Valve & Manufacturing Co. in the Southwest, is opening an office in Tulsa, located in the Thompson Building.

Timken's Plants Fly Joint Army-Navy Award Flags

For high achievement in the production of axles and other vital equipment to keep the United States armed forces rolling to victory, Timken-Detroit Axle Co.'s three plants, in Detroit, Mich., Waukegan, Ill., and Oshkosh, Wis., now fly the joint Army-Navy Production Award flags.

Brig. Gen. Joseph E. Barzynski, commanding general, Chicago Quartermaster Depot, led the official parties of high-ranking Army and Navy officers who made the presentations in the three cities.

General Barzynski, in presenting the award flag at Detroit, spoke of his long association with Timken during the last postwar period when the company cooperated in motorizing and mechanizing the U. S. Army. R. J. Goldie, Timken vice president, accepted the award for the company.

Col. E. H. Besse, Fort Sheridan, Ill., presented the award flags at Timken's Waukegan and Oshkosh plants, and Walter F. Rockwell, president, received the award in behalf of the company.

Lt. Col. John Newton Gage, executive officer, Chicago Quartermaster Depot, made the token presentation of "E" Award pins to employes at the daytime ceremonies at the three plants, and Maj. W. W. Gildersleeve, of the Chicago Quartermaster Depot, presented the pins at the Detroit night ceremony.

TRADE LITERATURE

LINDE AIR PRODUCTS CO., 30 East Forty-second Street, New York.—Quarterly issue (October 1942) of Oxy-Acetylene Tips. Contains many practical suggestions for repairing and reclaiming broken equipment and machinery parts, and for conservation of materials in welding.

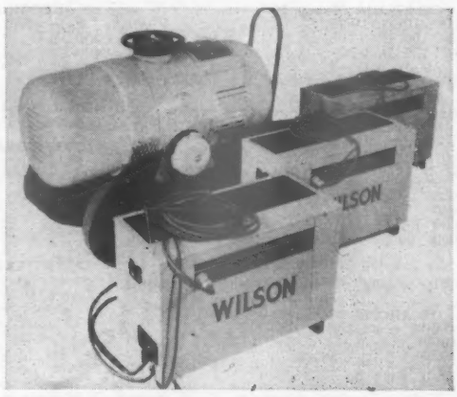
ALLIS-CHALMERS MANUFACTURING CO., Milwaukee, Wis.—Handbook for wartime care of V-belts. Titled "Plain Facts on Wartime Care of Rubber V-Belts," and available upon request. It begins with the anatomy of a V-belt and principle of V-belt drive, and ends with post mortems on actual damaged V-belts. The handbook tells how the anatomy of a V-belt affects its maintenance, how to obtain proper V-belt tension, and what to do about worn sheaves.

CENTURY ELECTRIC CO., 1806 Pine Street, St. Louis, Mo.—Series of seven bulletins designed to help both those who cannot buy motors now and those who are working on high-priority jobs. They are written to cover installation and care to help the user and insure the longest service possible. A system of suggested helps is offered to eliminate first one thing and then another to assist in locating trouble when something goes wrong or when the motor or generator does not operate.

B. F. GOODRICH CO., Akron, Ohio.—Booklet, "Rubber Conservation for Users of Industrial Rubber Belting," which contains a step-by-step procedure for making repairs on conveyer belts by the use of portable electric vulcanizers as one of its principal features. Interesting examples of savings already made, and valuable rubber conserved are given.

Arc-Control Stations Increase Capacity of Generators

Greater welding output per machine, better control by the operator and improved welds on thin-gage metal are advantages claimed for the use of the Honey Bee Arc-Control Station recently developed by Wilson Welder & Metals Co., New York.



Three Wilson Honey Bee arc-control stations attached to Wilson Hornet welder

These arc-control stations are made in capacities of 75 and 150 amp. They are an auxiliary electric device, connected in series with the welding circuit of any constant potential arc welding generator. Most conventional drooping voltage generators can be converted quickly and easily to constant potential. For this purpose, Wilson supplies a quick-change switch mounted on the generator. A portable switch held in the operator's hand gives the operator remote control of the welding current within predetermined limits. This switch may be combined with the electrode holder, if desired.

When two or more arc-control stations are hooked up to a single generator, a like number of welding arcs can be operated simultaneously. Each operator can regulate his own current and weld as he sees fit without affecting the other in any way. One feature of this new arrangement is the remote control of the arc when the operator reaches the end of a bead, thereby enabling him to greatly improve the quality of the weld deposit at the crater. This is accomplished by gradually reducing the current which, in turn, reduces the heat and avoids porous, cracked craters and inclusions. Each operator has his choice of two methods of control:

1. He can set his Honey Bee to deliver a definite

current at the arc and weld steadily at that setting.

2. He can use the hand switch to vary the current without breaking the arc. This enables him to start his arc on cold metal with a maximum current (hot arc) and to reduce the current as the work warms up.

Using two 75-amp. arc-control stations, a 200-amp. generator can serve two operators instead of one. The result is greater production. Higher efficiency and a better load factor also result because the generator is operating nearer to its rated capacity at all times. Similarly a single 400-amp. generator can be made to serve five to six 76-amp. stations, or three to four of the 150-amp. stations. Each operator can draw precisely the amount of current he wants (up to the capacity of his station) at all times, regardless of what current the other welders are drawing.

New Admixture Is Developed For Oil-Base Drilling Fluid

A newly developed admixture for making an oil-base drilling fluid is being manufactured by Oil Base Drilling Fluids Co., Los Angeles, Calif. Instead of using a standard clay-base drilling mud, this admixture embodies a material in powder form mixed with an oil base which can consist of any suitable stove oil, absorption oil, diesel oil or kerosene distillate. Known as "Black Magic," it has been used successfully in the Coles Levee field in California.

Weight of the fluid made with this material is approximately 72 lb. per cu. ft. Weight material may be added if necessary. The fluid is particularly adaptable for circulation while drilling or coring oil-bearing sands. Because it contains no water except connate water picked up while circulating the fluid should also aid considerably in preventing sloughing and caving when drilling through hydrous disintegrating shale, the manufacturer claims.

If the fluid is properly mixed, there is practically no fluid loss, according to the manufacturer. Filter cake tests made by A.P.I. standards show zero filtrate loss. Cores are uncontaminated and are merely coated with this cake. The cake disintegrates in the presence of crude oil which has an aromatic content and when such crude is pumped into a well to displace the oil-base drilling fluid after completion, it readily removes the plastering cake from the wall of the well.

Gel properties given to the fluid by the admixture have been found particularly satisfactory. The fluid recovers fluidity rapidly on slight agitation. Temperatures in excess of 240° F. have been found to have little effect on the gel or plastering properties. There is no formation of sludge to seal off the sand, and no hard gummy substance that might stick the pipe is produced. Viscosity ranges between 50 and 60 seconds, measured by A.P.I. Marsh funnel standard. Since oil-base muds do not readily gas-cut, higher viscosities can be maintained.

The fluid is recovered after a well is drilled and can be reused. While a water contamination up to 14 per cent has been found to have little or no effect on this fluid, there is no necessity of using this fluid with a high water content. It can be regenerated automatically either while in the circulating system or in storage by the addition of more of the powder. In the case of stored fluid it is the practice to mix an amount of new fluid necessary to bring the total quantity up to the amount desired and add this to the old fluid.

Oil Base Drilling Fluids Co. was formed by George L. Miller and J. A. Moore, widely known West Coast drilling fluid engineers. Offices have been established at 1616 Santa Fe Avenue, Los Angeles.

Maritime Commission Presents Production Award to Kerotest

Kerotest Manufacturing Co., Pittsburgh, Pa., has been presented the U. S. Maritime Commission production award with ceremonies being held in the company's newly completed building and broadcast over radio station KDKA.

Making the presentation of the award was C. E. Walsh, Jr., chief of the commission's procurement division. The Maritime "M" pennant and the Victory Fleet flag were accepted on behalf of Kerotest employes by E. G. Mueller, president. John Walters, chairman of the Employes Maritime Day committee, accepted the labor merit pins, given to all employes.

Following the presentation and acceptance speeches, Walter G. Swaney, general manager of the company, pledged that both labor and management would regard the awards as a spur toward greater production achievements. Acting as master of ceremonies was Ford Bond, ace NBC announcer from New York City.

IDECO Names Two

Marcus T. McGriff was recently appointed manager of stores and sales of the supply store department of International Derrick and Equipment Division of International-Stacey Corp., Columbus, Ohio. Mr. McGriff came with IDECO 4 years ago to organize this department and has been active in developing this branch of IDECO's business. He is a native of Alabama and received his education in Alabama and North Carolina. He has been a resident of Shreveport, La., for 15 years. From 1928 to 1932 was spent with Peden Iron & Steel Co.'s oil-well supply department. After leaving Peden, Mr. McGriff operated as a manufacturer's agent for several large manufacturing firms until his affiliation with IDECO.

C. M. Powell, recently appointed manager of oilfield equipment for International Derrick & Equipment Co. of Columbus, Ohio, is well known to the oil fraternity.

A native Texan, born near Decatur, Mr. Powell completed his business education in Dallas. After serving with armed forces in World War 1, he became interested in the oil-well-equipment business and was closely associated with many of the early boom fields in Texas.

Joining the IDECO organization in 1925 as district manager of Oklahoma, Mr. Powell was division manager of Oklahoma, Kansas, Illinois, and Indiana at the time of his new appointment. Before his connection with IDECO, Mr. Powell was assistant sales manager of Bridgeport Machine Co. of Wichita, Kans., and district manager of Black, Sivalls & Bryson, Inc., working out of Wichita Falls, Tex. He now resides at Tulsa.

Ohio Injector Co. Awarded "E" Pennant by Army-Navy

Ohio Injector Co., valve manufacturer, Wadsworth, Ohio, has been awarded the Army-Navy "E" for high achievement in the production of war equipment. The "E" pennant was presented formally at colorful ceremonies in the company's new steel-valve plant attended by employes and their families and thousands of fellow townsmen. Gov. John W. Bricker of Ohio and Capt. R. P. Schlabach, U. S. Navy, who presented the pennant, were the principal speakers. The program was broadcast over the Mutual system with John B. Kennedy as master of ceremonies.

The pennant was received and acknowledged by P. M. Arnall, executive vice president of the Ohio Injector Co. The Army-Navy "E" pins were presented to employes of the company by Lieut. A. R. Staudt, U.S.N.R., and were acknowledged on behalf of the employes by Charles Taylor.

Army-Navy "E" Pennant Goes To Armstrong Brothers Tool Co.

Armstrong Brothers Tool Co., Chicago, Ill., has been awarded the Army-Navy "E" pennant for achievement in the production of war materials. All employes have been awarded the customary "E" pins. Formal presentation was made at appropriate ceremonies at the company's factory in Chicago.

DOUBLE-SEAL PARTITION VALVE BY HAMER OIL TOOL CO.

A new valve is designed to effect a permanent, positive shutoff under pressure with one-man operation, replacing the customary two gate valves with slip blank blind between them used in refineries, gasoline plants, and pipe-line applications.

The Hamer Double-Seal Partition valve manufactured by Hamer Oil Tool Co., 2023 Semmes Street, Houston, Tex., consists of a single body containing two opposed valve members which close against seats situated in a central partition. Both valve members are synchronized and raised or seated simultaneously through powerful worm gearing operated by a single hand wheel. The operating gears are sealed in a compartment separated from the valve chamber and are packed in grease. The powerful gearing permits quick, easy opening of the valve under pressure and also insures tight contact of the valves and seats when closed. An external indicator shows whether the valve is open or closed. A small bleeder drains the space in the partition between the valve seats to provide a positive check of the shutoff when the valve is closed.

Advantages claimed for the double-seal partition valve are: It can be installed in existing hookups, releasing the two gate valves and slip blank for service elsewhere; in new installations, this single unit streamlines the manifold, conserving space and reducing the amount of new equipment needed. In both cases, this valve eliminates all time and labor required in blinding lines and avoids the waste and fire hazards caused by spilling fluid. Maintenance costs and line shut-down time are reduced to the minimum, and shop repair is eliminated, because new valve members and seats can be installed quickly and cheaply while the partition valve is in the line. The valve members are designed for a double sealing action, having both metal-to-metal contact with the ground surfaces of the seats, and neoprene squeeze-tight pressure seals. The valve members swing to and away from the seats, eliminating "wire draw" heretofore so damaging to valves.

As this valve is operated by one hand wheel which closes both valve members equally and at the same time, the possibility of one valve being partly open—as often happens when double gates are used—is avoided.

The fluid passage through the valve is a straight-through, oversize round opening, providing sufficient clearance for all line-cleaning devices such as a spinners, scrapers, swabs, etc. The valve may be used in any position desired, can be operated by remote control such as extension rods or electric motor, and can be used at temperatures from below zero to as high as 850° F.

CLASSIFIED ADVERTISING

THE MARKET PLACE OF THE OIL INDUSTRY . . .

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All cases submitted given personal attention.

Form "Evidence of Conception" with instructions for use and "Schedule of Government and Attorney's Fees"—FREE.

LANCASTER, ALLWINE & ROMMEL
Patent Law Offices
418 Bowen Bldg., Washington, D. C.

Leases and Drilling Blocks

LEASES—East Texas, La., South Ark. 20 acres up, dollar acre up.—Owners—Address Attorney, Box 1122, Little, Rock, Ark.

LEASES ROYALTIES

PRODUCING OR NONPRODUCING

Texas, New Mexico, Oklahoma.
Louisiana and Illinois
20 Years' Experience
Inquiries Invited

B. D. BUCKLEY
60 Broadview Drive, Clayton
St. Louis, Mo.

FOR SALE: Oil and Gas Leases on proven structures, drilling propositions, small production and fluorspar deposits. Reports furnished. W. P. Harley, Bowling Green, Kentucky.

GEORGIA
Deep Drilling now on in Georgia. For information write, C. W. DEMING, Waycross, Ga.

ILLINOIS WILDCATTER
Thoroughly posted as to possibilities for shallow production, in Coles and Edgar counties, acreage for sale, or for test. Sam J. Burkitt, Chrisman, Ill.

FOR INVESTMENT with great opportunity from oil, buy land developing R.M. area, $7. acre. Box B-321, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE: Oil and gas leases North and South Dakota, ten cents acre. Owner, P. O. Box 1163, Tulsa, Oklahoma.

8000 ACRE STRUCTURE full geology, geophysical, cored, equipped rotary & cable. Contractor drafted. Must deal for completion. S. W. Pressey, Pueblo, Colo.

Royalties

ANDREW J. BARRETT
The Philtower
Tulsa, Oklahoma.

WE BUY & SELL all types of Oil and Gas Royalties. Sales restricted to registered dealers only. Grimes Royalty Co., National Mutual Bldg., Tulsa, Okla.

FOR SALE: Landowner's Royalty under 160 acres leased to Humble Oil & Ref. Co. in Lea Co., N. M. North of the Big Hobbs Pool. 27 pools in County, HARRY S. WRIGHT, FARMINGTON, N. M.

Financing

CAPITAL SEEKERS — Interested in raising $25,000 or more for a legitimate project should communicate with AMSTER LEONARD, Fox Theater Bldg., Detroit, Mich.

CORPORATION FINANCING, mining or oil. Services and facilities offered to assist undertaking merit. Box B-300, The Oil and Gas Journal, Tulsa, Okla.

Business Opportunities

IN OKLAHOMA mining field 400 fine ranch farm land, improvements, four developed zinc mines shafts sunk ready be equipped placed production. Address O. D. Baker, Miami, Okla.

If we do not maintain a classification exactly suited to the type of advertisement you wish to run we shall be glad to create a fitting one. *Classified Department.*

Oil Industry Printing

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press 215 East Third St., Tulsa, Okla.

Legal Blanks

THE BURKHART LINE of Legal Blanks Since 1908. Oil-Gas and Business Forms for Mid-Cont. and Illinois Basin. Leases Rev. with Gov.'s Regulations. Catalog and Samples. Burkhart Ptg. & Sta. Co., 115 So. Cincinnati, Tulsa, Okla.

Help Wanted

NOTICE TO ADVERTISERS

Advertisers offering positions to workers skilled in critical war industries are requested by the War Manpower Commission to include the following sentence in their advertisement:

"Applications from those now employed in war industries will not be considered."

ENGINEERS WANTED
Chemical or Mechanical with minimum one year oil refinery plant operation or maintenance experience. Require University Engineering School graduate with basic knowledge principles fluid flow. To work on process flow sheets, equipment selection and general handling oil refinery. Defense Contracts as assistant to senior engineers. No aliens or men engaged Defense work considered. Opportunity up to individual. In reply state experience, education, draft status, salary expected. Foster Wheeler Corporation, Room 2402, 165 Broadway, New York.

Situations Wanted

25 YEARS oil producing, drilling, management. Understand financing. Address Box B-341, The Oil and Gas Journal, Tulsa, Okla.

EFFICIENT executive-accountant, married, age forty-eight, twenty-five years experience all phase oil and pipeline accounting, state and federal reports, personnel and office management, desires permanent responsible connection with reliable independent Texas operator. Now employed by large state regulatory department and have close contact throughout Texas with various agencies supervising oil and gas industry. Box B-340, The Oil and Gas Journal, Tulsa, Okla.

DESIRE connection with Oil Company in Land Department. 20 years experience in leasing and development work. In good health, not in draft age. Can furnish references as to my ability and character. Write P.O. Box 1644, Fort Worth, Texas.

Equipment Wanted

WANTED

Abandoned *Pipe Lines*, in or out of the ground, *Oil Wells, Steel Buildings* and Steel Storage *Tanks* of all sizes.

JOS. GREENSPON'S SON PIPE CORP.
National Stock Yards, St. Clair Co., Illinois.

WANTED — Steel tanks total 120,000 gallon capacity. Will take 5000 gallon or larger. Tidewater Equipment & Machinery Corp., 305 Madison Ave., New York, N. Y.

WANTED: Inside Micrometers, range 2 in. to 14 in.; also outside micrometers, same range. Would consider instruments covering part of these ranges. In reply give make, style, graduations, and price.
TALCO ASPHALT & REFINING DIVISION OF SOUTHPORT
P. O. Box 1011, Mt. Pleasant, Texas.

ONE—3000 to 5000 KW Generator, 3 phase, 60 cycle, 6600 Volt, 3600 RPM, AC.
INDUSTRIAL EQUIPMENT CO.
338 Baronne St., New Orleans, La., RA. 0889

WANTED: Used wax molding press. Please state condition, location, and price. Box B-293, The Oil and Gas Journal, Tulsa, Okla.

1 SET of Hydraulic Casing Pulling Jacks for 2,000' wells, must be reasonable. A. A. Gilbert Pipe & Supply Co., P.O. Box 986, Shreveport, La.

WANTED TO BUY

Pipe of all sizes, 2" to 16", inclusive, also refineries, pipe lines and abandoned wells. Wire, write or phone

Louisiana Iron & Supply Co.
Shreveport, La.

For Sale—Equipment

FOR SALE: 4—5¾ & 6¾ x 12 Airline Slush Pumps; good condition; very reasonable. W. J. Perlitz, 2720 Bernhardt Drive, Phone 6978, Port Arthur, Texas.

1 BESSEMER Compressor 80 B.H.P. 16x20" Power Cylinder 11½x20" Compressor Cylinder. Mercoid Controls. Harvard Gas Company, 502 K.B.&T. Bldg., Charleston, West Va.

For Sale—Equipment

FOR SALE: Two Double Drum Card well Spudders, mechanical, like new. Complete tools, lines, dog house, and light plant. Room 314, Insurance Bldg., Oklahoma City, Okla.

TANKS FOR SALE
220,000 gal. 43' x 20' Steel Tank. 1—14,000 gal. and 2—11,000 gal. and 1—8,000 gal. Steel Tanks. 12—9' x 8' Wood Tanks 2—10,500 bbl. 50' x 30' steel tanks with steel roofs.
L. M. STANHOPE
Wayne, Penna.

TRUCKS

2—International Model KS-7, 176" wheelbase chassis, 6.14 & 8.52:1 gear ratio; 8.25 x 20 10-ply front and 9.00 x 20 dual rear tires; standard cab, two-speed rear axle; equipped with Tulsa Winch Manufacturing Company split shaft power take-off.

1—International Model K-8-F tandem, 197" wheelbase chassis, 7.16:1 gear ratio; 8.25x20 10-ply front and 9.00 x20 dual rear Ground Grip tires; standard cab, FBC-401 engine with F-52-C transmission; equipped with Tulsa Winch Mfg. Company split shaft power take-off and Model 18 winch mounted on rear of truck under chassis.

The Parkersburg Rig & Reel Company
O. C. S. Division
Coffeyville, Kansas
Phone LD 7022 P. O. Box 573

FOR SALE—A large stock of reconditioned valves and fittings suitable for refinery and pipe line service. Inquire Eason Oil Company, Enid, Okla.

FOR SALE: 15,000' Used ¾" Pull Rods with turtle back connections in perfect condition, 10c per ft. A. A. Gilbert Pipe & Supply Co., Box 986, Shreveport, La.

10,000 ft. 2½" Standard black pipe. New threads. Good condition. J. S. McLaughlin & Sons, 4047 Urbandale Avenue, Des Moines, Iowa.

FOR SALE — Three 15 x 10 and one 12 x 10 Pneumatic Compressors less motors or power units. In excellent condition, suitable for low pressure service. Inquire Eason Oil Company, Enid, Oklahoma.

2—120 HP, 650 RPM, rebuilt Diesel engines, power units.
1—200 HP, 514 RPM, completely rebuilt Diesel engine, power unit.
The two above can be supplied with Generators if desired.
2—66 HP Boilers.
1—75 HP variable speed A.C. motor.
Also variable sizes small alternating current motors.
K. S. RICHARDS
P.O. Box 443, Fort Worth, Texas
Phone 3-5600

FOR SALE — Type 5-C-3 Union Tool Unitized Draw Works with Automatic Cathead. A-1 Shape. Make Offer. P. O. Box No. 1513, Oklahoma City, Okla.

FOR SALE: Complete Power Rig with three caterpillar Diesel motors, 425 H.P., suitable for 7000 foot drilling. Write Box 711 Longview, Texas.

1 COOPER-Bessemer 8 cylinder engine Type G M R size 12" x 14", 225 HP direct connected to Cooper-Bessemer Compressor, high side 12" x 14", low side 6½" x 14". Excellent condition. Box B-291, The Oil and Gas Journal, Tulsa Okla.

TWO vertical type Askania Magnetometers. Also one complete Heiland resistivity outfit. Write Box B-285, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE: Two Kobe Triplex pumps with Buda engines 3 down hole production units, and all assembly complete to pump 3 wells. Excellent condition, less than 2 years old. Priced right. Box 653, Blackstone Hotel, Tyler, Tex.

FOR SALE: 7¼ x 14 Oil Well Power Slush Pump. Melton Machinery & Supply Co., Seminole, Okla.

CLASSIFIED ADVERTISING RATES

Classified advertising rates: First insertion, 35 cents a line; each additional insertion, 25 cents a line, PAYABLE IN ADVANCE. Six words usually make a line. Count as a word each one-letter word and each group of figures. White-space computed at regular line rate. Allow two extra lines for blind ads. Ads of less than three lines not accepted. No formal acknowledgment is made, and proofs cannot be shown in advance of publication.

	1 time	2 times	3 times	4 times		1 time	2 times	3 times	4 times
3 Lines	$1.05	$1.80	$2.55	$3.30	7 Lines	$2.45	$4.20	$5.95	$7.70
4 Lines	1.40	2.40	3.40	4.40	8 Lines	2.80	4.80	6.80	8.80
5 Lines	1.75	3.00	4.25	5.50	9 Lines	3.15	5.40	7.65	9.90
6 Lines	2.10	3.60	5.10	6.60	10 Lines	3.50	6.00	8.50	11.00

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Classified Display is set with a border and may be used in one or two column sizes

1 Inch	1 time	$5.00
1 Inch	13 times	4.50 per inch
1 Inch	26 times	4.00 per inch
1 Inch	52 times	3.50 per inch

This space may be contracted for over a period of one year from the date of the first insertion and is PAYABLE IN ADVANCE, MONTHLY.

We reserve the right to withhold all advertising of questionable character. To avoid delay be sure to send remittance with copy. We will set your ad in the smallest amount of space possible and refund all overpayments. One-time insertions will not be run until fully paid. Forms close MONDAY NOON before each issue date.

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

COMPLETE DUBBS REFINERY FOR SALE

Vis-Breaker, Topping and Asphalt Plant

4,000 barrel topping—2,000 barrel Vis-Breaker—500 barrel Asphalt—Less than 25,000 barrels of crude ever put through this plant. Complete instrument board, new, never hooked up. Electric-eye control. Electric salt Settlers. Pump house complete with explosion proof motor driven centrifugal pumps.

18 heat exchangers. Over 50 tanks from 250 barrels to 25,000 barrels included. Car load Ethyl plant. Latest type of equipment offered for sale by any refinery.

Location: Titan Oil Co., Stark, Mich. (Detroit suburb) For sale in its entirety, parts or will lease in its entirety. Have complete Universal Oil Company's inspection report, together with all blue prints.

SONKEN-GALAMBA SUPPLY COMPANY

W. C. Berry or H. J. Galamba
Riverside at Second, Kansas City, Kansas

Robert W. Duden
Union Ave. at Twenty-First, Tulsa, Oklahoma

FOR SALE

1—Crude heater complete with stock and accessories, capacity 2000 bbl. Built new 1939 by Foster Wheeler Corp.

1—Perco copper sweetening unit complete, including steel building. Capacity 500 bbl. Located Great Bend, Kansas.

SONKEN-GALAMBA SUPPLY CO.
Union Ave. at Twenty-First St.
Tulsa, Okla.

USED STEEL STORAGE TANKS
VERY GOOD CONDITION
READY FOR IMMEDIATE SHIPMENT
Riveted—Match-Marked—Knocked-Down
1—20,000 bbl. 75' dia. x 25'5"
1—30,000 bbl. 90' dia. x 25'6"

5—10,000 gal. 7' dia. x 35'
3—20,000 gal. 12' dia. x 24'
3—Rectangular 14' x 10' x 7'
10—Truck tanks, 600 to 1800 gal. 1 to 6 compartments.
J. C. MARTYNS
Gen. P.O. Box 297, New York City

F&M Power Pump, 3" x 4", excellent condition. Also Centrifugal and Steam Pumps. GILBERT PIPE & SUPPLY, Electra, Tex.

FOR SALE: 30—1½ KW Steam Turbine Generators. $25.00 each. Patridge, Cities Service Oil, Bartlesville, Okla.

25 K.W. and 40 K.W. Gas Engines, 220 volts, D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x6 Ingersoll-Rand ER-1 Air Compressor. Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.
Terms to suit.
CINCINNATI MACHINERY & SUPPLY CO.
26 West 2nd St., Cincinnati, Ohio.

FOR SALE: Approximately 250—2", 3", 4" and 6" LH EH SL UP Klein Pipe Tongs, used. $1.00 per inch per tong. Patridge, Cities Service Oil, Bartlesville.

FOR SALE

40,000 feet ⅝" API
Sucker rods

Al Brown Kilgore, Texas

CLARK BROS. 4-cyl. 8½ x 11, 110-H.P., 400-R.P.M., 4 cycle vertical gas engine. One 2-cyl. vertical tandem 5½" and 10¼" x 11, 400-R.P.M. gas compressor; compressor shaft connected to above engine. Will sell either separately. Engine may be used for generator or power drive. Excellent condition. Box B-342, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE AT BARGAIN—2 complete drilling rigs, 1 Unit Rig Company U-10 with 13,000 Diesel caterpillar with 7½ x 12 G. D. pump; also 1 type R. Cardwell double drum draw works, 160 HP engines ready to move on job. Box 1489 Tulsa, Okla.

DIESEL—GAS—ENGINES
Large selection — All sizes and types. Generator units, marine engines, gasoline engines, auxiliaries—boilers, steam engines, and turbo-generator sets.
Complete information on request.
A. G. SCHOONMAKER COMPANY
48 Church Street, New York, N. Y.

40,000 Ft. 2" Line Pipe, Screw & P.E. Also 3", 4", 5½", 7", etc. Large stock of fittings, valves & other used material. GILBERT PIPE & SUPPLY, Electra, Tex.

FOR SALE: Star Mfg. Company, portable cooling tower, telescoping type, 7' wide, 13' long, 8' high. All steel. Melton Machinery & Supply Co., Seminole, Okla.

FOR SALE: Complete Wilson Portable Rotary Rig with telescoping mast, suitable for 2,000 ft. drilling. Melton Machinery & Supply Co., Seminole, Okla.

FOR SALE: 27½" Ideal Rotary Table, 3 sheave 200 ton Crown Block, 4 sheave 72" traveling block, 8" Ideal enclosed rotary hook. Melton Machinery & Supply Co., Seminole, Okla.

STORAGE TANKS, Vessels, Towers, Pumps, Engines, Compressors, Meters, etc. GILBERT PIPE & SUPPLY, Electra, Tex.

FOR SALE: 12 K.W. Portable Light Plant Powered by 35 H.P. International Engine. Melton Supply Co., Seminole, Okla.

¾" Oklahoma City used sucker rods, 50,000 feet, good condition. 50—10 and 12" x 23' Channels. 3—24" x 20' Beams and some short pieces, smaller sizes. Some reinforcing sucker rods, all at Oklahoma City. M. R. Travis, 1702 S. Boulder, Tulsa, Okla.

2—450 H.P. Water Tube Boilers, 1—955 H.P. Water Tube Boiler.
2—Steel Buildings 80'x135' and 80'x104'.
2—3000 c.f.m. Air Compressors.
1—2500 c.f.m. Air Compressor.
Large Assortment of Small Compressors.
1—100,000 gal. Steel Tank on 100 Foot Tower.
1—25,000 gal. Steel Tank on 90 Foot Tower.
1—35,000 gal. Steel Tank on 50 Foot Tower.
1—Bucyrus 3½ Yard Diesel Dragline.
1—Bucyrus 18 Ton Steam Crane on Cats.
2—5,000 Barrel Steel Storage Tank with Wooden Roofs. Large assortment of smaller tanks.
Large assortment of used Steel Plates, I-Beams, Channels, Pipe and Fittings.
INDUSTRIAL EQUIPMENT CO.
338 Baronne St., New Orleans, La.
RAymond 0889

FOR SALE
1—Imperial Type 10, 10"x4½"x10" compressor with 100 H.P. G.E. motor, skid mounted.
1 each—3'x10', 5'x15', 7'x24' separators, standard pressure.
1—15 H.P. F & M Gas Engine.
1—3'x7' scrubber tank.
Miscellaneous group of valves and fittings, 3" up.
1—Model 47 F & M oil engine, skid-mounted, complete with fuel tank.
Vaughn S. Bryan Phone 4-4111
Kennedy Bldg. Tulsa, Okla.

BARGAIN—12 KW 125-Volt G. E. Generator complete with switch board, etc. GILBERT PIPE & SUPPLY, Electra, Tex.

FOR SALE
178, 55-ton DOUBLE HOPPER CARS, USRA TYPE
All-steel, self-clearing: 1880 feet capacity. Built 1920, 1921 and 1922
A-B Brakes and full "U" Truck Frames
Also, fair quantity of New Repair Materials available.
MUST BE DISPOSED OF IMMEDIATELY, so if of interest ACT NOW!
IRON & STEEL PRODUCTS, INC.
37 years' experience
13412 S. Brainard Ave. Chicago, Illinois
"ANYTHING containing IRON or STEEL"

USED SPUDDERS

We offer for immediate delivery, three "Cardwell" Model K Spudders, Complete with Mast, 145 H.P. Waukesha Motors, 1500 Watt Kohler Light Plants, Wire Lines, Drilling and Fishing Tools, Fittings and Supplies. Each a Complete Unit.

Drilling capacity up to 5000 feet. All practically new. Used less than nine months. Located our yards, Salem, Illinois.

PRICED FOR QUICK SALE

THE BRIDGEPORT MACHINE COMPANY
WICHITA, KANSAS

Canadian Fields

(Continued from Page 70)

sand from 3,197 ft., followed by water. Hi-Test 2, LSD 5, 22-9-16w4, southeast of Taber, has spudded.

Ram River Test

In the foothills northwest of Calgary, Ram River Oils 2, LSD 8, 1-37-11w5, standing at 4,340 ft., is recementing to shut off water in the upper formations, preparatory to a production test of oil shows in the Devonian between 4,250 and 4,325 ft. Operations have been handicapped by bad weather and difficult transportation conditions, location being in an isolated area with no roads. Showings have been encountered in several lime horizons and a bailing test indicated a fair commercial production of light crude in the Devonian limestone below 4,250 ft.

Shell Operations

On the Jumping Pound structure, in the foothills west of Calgary, Shell Exploration-Norman 1, LSD 5, 22-24-5w5, is below 3,335 ft. and nearing production depth. The well is some miles south and west of previous tests, some of which got crude showings but failed to develop commercial production.

In the Jasper Park area of the northern foothills, Shell Exploration-Solomon Creek 1, 17-51-27w5, is below 2,807 ft.

In southern Saskatchewan, North west-Radville 1, LSD 16, 36-5-19w2, which developed a fishing job at 7,958 ft., is redrilling from 5,587 ft. Hole will be carried to around 8,500 ft. for a comprehensive test of the Madison, Devonian, and Ordovician limestones.

Saskatchewan Activity

In southwestern Saskatchewan, Twin Provinces 1, LSD 6, 21-11-29w3, standing at 2,600 ft., will be deepened by Alberta Drilling & Development Co., in association with Cobb & Burke, to 3,400 ft. to test the lime. Casing has been run to 2,300 ft. and the hole cleaned out, disclosing some oil and gas shows.

In the area between Fort Qu'Appelle and Indian Head, Lakeside Oil & Gas Syndicate has two structure tests, Hiawatha 1, LSD 3, 10-20-13w2, at 303 ft. and Lakeside 1, NW 32-20-13w2 at 306 ft.

La.-Arkansas Fields

(Continued from Page 70)

bbl., Smackover 6,469-76 ft., T.D. 6,490 ft.

MISSISSIPPI COMPLETIONS

Hinds County: Tide Water 1 Moore, 12-6n-4w, dry, T.D. 8,990 ft.

Jones County: A.H.&C.C. Boweb 1 Jeff coat, 12-7-14, dry, T.D. 8,885 ft., Wilcox 2,405 ft., Eutaw 7,132 ft., Tuscaloosa 7,478 ft., Marine Tuscaloosa 8,783 ft.

Lamar County: W. S. F. Tatum 1 Tatum, 13-2n-16w, dry, T.D. 4,661 ft.

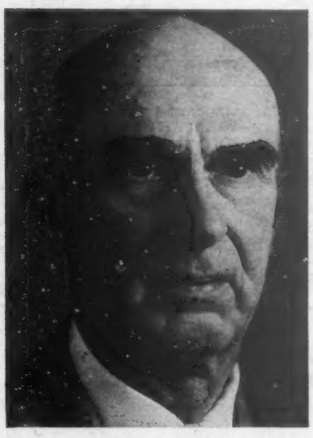
Tunica County: H. I. Morgan 2 University, SW SE 32-3s-10w, dry, T.D. 8,500 ft.

Tinsley, Yazoo County: J. P. Evans 1 Johnson, SE NW 31-10n-2w, T.D. 3,309 ft., salt water disposal well.

Journalisms;

FRED L. SINGLETON who has been in charge of field reports for the Gulf Coast and the Southwest Texas areas established a record for the Journal's staff in getting into the Army. Fred made application for the aviation branch of the service on Wednesday, was examined on Thursday, accepted on Friday and sworn in on the following Monday. He is now stationed at Ellington Field near Houston for preliminary training He is one of the members of the Journal's staff who has had more than a decade of service. He started writing at the Journal's Fort Worth office and was later transferred to Houston. His military service to date has not given him time to provide us with a photograph.

Fred's departure brought a veteran of the Journal's staff back into active service. Thomas F. Smiley, who retired in 1940 after



T. F. SMILEY

13 years with the Tulsa headquarters, has taken over the duties of the field department at Houston. Tom who says he "is a little rusty" as to what has been going on in the oil business, due possibly to many months of Florida sunshine, adds that he will be back to the "preretirement stride" in a few days.

•

THE petroleum coordinator's warnings that the oil industry may shortly be unable to meet the demand for crude receive support from a reader of many years' standing who has written us to say that the oil history of the last war is repeating itself today but under far more dangerous conditions of petroleum supply and reserves. Storage is being depleted as in the last war and the reserve situation is bad. Our correspondent says that if the last war had lasted longer, the petroleum crisis would have been something to remember. As it was it took $3.50 to $6 oil and 2 years of strenuous effort to restore the industry to normal conditions. Under present restrictions, both of activity and price, with a serious labor shortage and prospects of a longer war, our correspondent thinks that it will take 10 years and much good luck to repair the damage being done to the industry today.

•

A CHECK of the Journal's files shows that during the first 11 months of the last war completions dropped about 30 per cent despite a rise in price from $1.70 to $2 for Mid-Continent crude. During the past 11 months, drilling has declined practically 50 per cent and the price has remained at $1.17. Today drilling is at about the same level as in March 1918. The demand for oil is almost exactly four times as great

•

THE Journal's editorial staff is called upon to do considerable traveling in its efforts to cover the industry's news and engineering advances. On these trips they pick up impressions of various kinds which are of course reflected in Journal articles. Sometimes changing trends are indicated by ripples of activity or of interest. After being in the doldrums for some months, the drilling end of the business seems to be on the verge of an advance. One major company is reported to have increased its operations 150 per cent almost overnight in one sector. In another district, another major company is making desperate efforts to hold its personnel together as it anticipates an active drilling campaign within the next few months.

•

THE Oklahoma City field has often been in the news, first as a field in which production practices were not wholly sound from an engineering basis, later as the site of the world's largest secondary-recovery project which political considerations prevented from getting beyond the project stage. Meanwhile, a steady program of drilling in and around the field has been going on, with conspicuous success. More important has been a program of sidetracking and redrilling old wells in the heart of the field with even greater success. There are many advantages to redrilling old wells, even in a highly permeable sand and two articles, scheduled to appear in early numbers of the Journal will discuss recent events in Oklahoma's largest field as well as their significance to the petroleum production engineer.

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Dresser Mfg. Co., The	63
Economy Electric Lantern Co.	64
Elliott Company	55
Formica Insulation Co.	46
Garlock Packing Company, The	67
Gates Rubber Co., The	50
Grancell, I. H.	72
Halliburton Oil Well Cementing Co.	Inside Front Cover
Hughes Tool Co.	Back Cover
Hycar Chemical Co.	25
McCord Radiator & Mfg. Co.	65
McNamar Boiler & Tank Co.	55
Mission Mfg. Co., The	Front Cover
National Transit Pump & Machine Co.	17
National Tube Co.	2
Patterson-Ballagh Corporation	70
Peerless Pump Division of Food Machinery Corp.	72
Petroleum Advisers, Inc.	58
Reading-Pratt & Cady Division of American Chain & Cable Co.	58
Rector Well Equipment Co., Inc.	73
Reed Roller Bit Company	39
Seismic Explorations, Inc.	36
Seismograph Service Corp.	33
Smith Supply Co., Nowery J.	70
Thornhill-Craver Co.	64
Toledo Pipe Threading Machine Co., The	67
Universal Oil Products Co.	21
Westinghouse Electric & Mfg. Co.	42
Wisconsin Motor Corporation	68

CALENDAR

November

CALIFORNIA NATURAL GASOLINE ASSOCIATION, Los Angeles, Calif., November 6.

PETROLEUM ELECTRIC POWER ASSOCIATION, business session of member-company executives and election of officers, Baker Hotel, Dallas Tex., November 12.

AMERICAN PETROLEUM INSTITUTE, twenty-third annual meeting, Palmer House, Chicago, Ill., November 9-13.

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS, thirty-fifth annual meeting, Netherlands Plaza Hotel, Cincinnati, Ohio, November 16-18.

AMERICAN ASSOCIATION OF OILWELL DRILLING CONTRACTORS, second annual meeting, Mayo Hotel, Tulsa, November 19-20.

AMERICAN CHEMICAL SOCIETY, national chemical expesition and national industrial chemical conference, Sherman Hotel, Chicago, Ill., November 24-29.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, annual meeting, New York, November 30-December 4.

December

NEW MEXICO OIL AND GAS ASSOCIATION, annual meeting, Artesia Hotel, Artesia, N. M., December 2.

PETROLEUM ACCOUNTANTS SOCIETY OF OKLAHOMA. Hotel Mayo. Tulsa. December 17.

INTERSTATE OIL COMPACT COMMISSION, annual organization meeting, Biltmore Hotel, Oklahoma City, Okla., December 18-19.

1943

February

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, New York, February 15-18, 1943.

April

AMERICAN PETROLEUM INSTITUTE, Division of Production, Eastern district, William Penn Hotel, Pittsburgh, Pa., April 8-9, 1943.

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, annual meeting, Fort Worth, Tex., April 7-9.

May

PETROLEUM INDUSTRY ELECTRICAL ASSOCIATION, annual meeting, Houston, Tex., May 5-6, 1943.